

AN INVESTIGATION OF SOME  
ASPECTS OF THE PRICES AND COSTS  
OF HOSPITAL CARE

By  
HAROLD ROGER PHILLIPS

A DISSERTATION PRESENTED TO THE GRADUATE COUNCIL OF  
THE UNIVERSITY OF FLORIDA  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE  
DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

August, 1966



## ACKNOWLEDGMENTS

Although an author receives help from many sources, it is not always possible to assign specific credit for the assistance. I gratefully acknowledge a general debt to other scholars, teachers, colleagues and students whose assistance I am unable to identify except in a general manner.

Specifically, I am indebted to the University of Florida and its College of Business Administration for providing financial aid during the years of my graduate study.

Also, I express appreciation to Professor William V. Wilmot, chairman of my supervisory committee, as well as to the other members of the committee -- Professors D. J. Hart, L. J. Benninger, Max Langham, R. L. Lassiter and W. B. Riggan -- for their assistance.

I am grateful to the American Hospital Association for permission to make liberal use of material published by them in the American Hospital Directory and their annual Guide Issue of Hospitals.

Finally, I express my appreciation to my family for their patience and assistance. Especially to my wife, Betty, I express my gratitude for typing and retyping the manuscript.

Harold Roger Phillips

## CONTENTS

	Page
ACKNOWLEDGMENTS . . . . .	ii
Chapter	
I. INTRODUCTION . . . . .	1
The Problem, Its Nature and Importance . . . . .	1
Purpose . . . . .	11
Statement of Hypothesis . . . . .	11
Methodology . . . . .	12
Data . . . . .	14
II. SELECTED ECONOMIC AND SOCIAL CHANGES . . . . .	17
Population . . . . .	18
Age . . . . .	19
Race . . . . .	19
Sex . . . . .	20
Age, sex, race . . . . .	20
Marital status . . . . .	21
Urbanization . . . . .	22
Births, deaths, marriages, divorces . . . . .	23
Physicians . . . . .	24
Population density . . . . .	25
Employment . . . . .	27
Employment status . . . . .	27
Wage and salary income . . . . .	33
Personal income . . . . .	34
Average income of spending units . . . . .	35
Productivity . . . . .	36
Price Level . . . . .	40
Consumers' prices . . . . .	40
Wholesale prices . . . . .	42
Capital Accumulation . . . . .	42
Health Insurance . . . . .	46
Summary . . . . .	47



III. CAPACITY AND UTILIZATION OF SHORT-TERM GENERAL AND OTHER SPECIAL HOSPITALS: 1946-1960 . . . . .	48
Capacity and Utilization . . . . .	48
Hospitals . . . . .	49
Beds . . . . .	64
Admissions . . . . .	70
Average daily census . . . . .	93
Occupancy percentage . . . . .	105
Average length of stay . . . . .	111
Summary . . . . .	112
IV. PERSONNEL, EXPENSES AND ASSETS IN SHORT-TERM GENERAL AND OTHER SPECIAL HOSPITALS IN THE UNITED STATES: 1946-1960 . . . . .	122
Personnel . . . . .	122
Full-time personnel . . . . .	124
Full-time personnel per 100 patients . . . . .	137
Expenses . . . . .	150
Total expense . . . . .	150
Total expense per patient-day . . . . .	162
Payroll expense . . . . .	179
Payroll expense per patient-day . . . . .	183
Revenue . . . . .	203
Assets . . . . .	204
Plant assets . . . . .	204
Total assets . . . . .	223
Summary . . . . .	239
V. DEMAND FOR HOSPITAL CARE . . . . .	241
Simple Linear Demand . . . . .	241
Hospital Care Consumption Function . . . . .	253
Hospital Care Consumption Function Adjusted for Price Level Changes . . . . .	259
Summary . . . . .	265
VI. HOSPITAL COST FUNCTIONS . . . . .	266
Review of Pertinent Economic Theory . . . . .	266
Assumptions and Data Adjustments . . . . .	269
Short-run Costs . . . . .	280
Summary . . . . .	290

VII. SUMMARY OF FINDINGS AND IMPLICATIONS FOR MANAGEMENT . . . . .	231
Findings Which Support Hypothesis . . . . .	291
Findings Unfavorable to Hypothesis . . . . .	294
Topics Requiring Additional Research . . . . .	296
Implications for Management . . . . .	298
APPENDIX I . . . . .	303
APPENDIX II . . . . .	327
APPENDIX III . . . . .	333
APPENDIX IV . . . . .	339
APPENDIX V . . . . .	374
APPENDIX VI . . . . .	376
SELECTED BIBLIOGRAPHY . . . . .	379
BIOGRAPHICAL SKETCH . . . . .	387

## CHAPTER I

### Introduction

#### The Problem, Its Nature and Importance

Aggregate expenses<sup>1</sup> of all short-term non-federal hospitals in the United States increased from approximately \$1.2 billion in 1946 to \$5.6 billion in 1960. During the same period, total expenses per patient-day of these hospitals increased from \$9.39 to \$32.23.

Inasmuch as the post World War II period witnessed substantial economic expansion, one would expect that there would be sizeable increases in the aggregate expenditures incurred by hospitals in providing care. If this expenditure increase were the result solely of a shift in the demand schedule facing the hospital industry, the change could be shown as in Figure I-1.

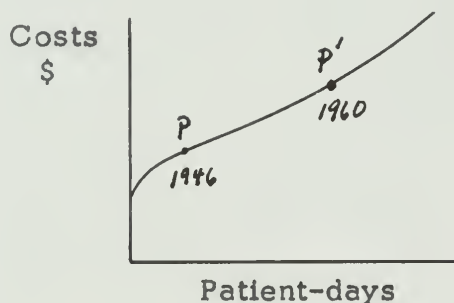


Figure I-1. Hypothetical shift on total cost curve for hospital industry between 1946 and 1960.

---

<sup>1</sup>The words "expenses" and "costs" are used synonymously in this study. Although these terms have different meanings to accountants and

The resulting change in amount of output (patient-days) and costs (total expenditures) is described by the movement of a point along the TC curve from P to P'.

It is possible that the increase in total expenditures could have resulted solely from a shift in the cost curve as shown in Figure I-2.

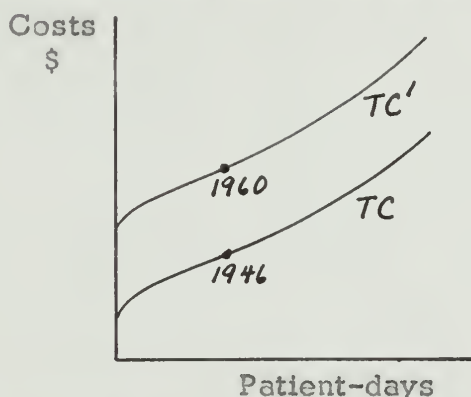


Figure I-2. Hypothetical shift of total cost curve for hospital industry between 1946 and 1960.

It is possible that there could have been shifts both in demand and in costs which caused the increase in total expenditures. It seems reasonable to assume that this is what occurred inasmuch as increases in population and income could be expected to shift demand, while an examination of the change in patient-day expense suggests that the cost curve also shifted.

Patient-day expenses, rising from \$9.39 to \$32.23, increased nearly 250 per cent. The consumers' price index during the same years increased

---

economists, the accounting "expenses" reported in the annual hospital survey appear to be similar to the economist's concept of cost. In some places, reference will be made to theoretical economic costs, for example, a total cost curve. The context of the discussion will make clear whether reference is to reported "expenses" or theoretical economic "costs."

about 50 per cent. Thus, it appears that there was a shift in the total cost curve caused not only by price increases but by other forces as well.

If the forces causing shifts in both demand and costs could be identified and the magnitude of their effects ascertained, such information would be useful for varied purposes by different groups.

Knowledge of the causative forces would enable hospital management to achieve its objectives more effectively and economically than would otherwise be possible.

Employees of the hospital might benefit from better administration through an improved wage structure as well as increased personal satisfaction from being more effective in their work.

The patients might benefit from better care at a possible reduction in cost. Also, to the extent that the patient helps support hospitals through taxes or voluntary contributions that he makes, he along with the rest of the general public will be interested in any legitimate means of reducing the "burden."

Finally, the public will be interested in another respect which is commonly identified as the community's obligation to protect the health of its citizens.<sup>1</sup> The obligation implies that the community has both the duty and the power to regulate the conduct of hospitals. While the regulation may take different forms, it includes such aspects as location,

---

<sup>1</sup>Max Shain and Milton I. Roemer, Hospitals and the Public Interest (Ithaca, New York: Graduate School of Business and Public Administration, Cornell University) reprinted from Public Health Reports, Vol. 76, No. 5 (May, 1961), pp. 401f.



size of hospitals and rates to be charged for various services. Obviously, one may badly err when making such decisions unless he knows something about the forces that influence the costs of providing service.

Public attention, both individually and collectively, has been focused upon hospital expenses.

In 1958 the insurance commissioner of Pennsylvania issued a now-famous adjudication on the application of the Philadelphia Blue Cross plan for a premium increase. In explaining his refusal to grant the increase, the commissioner offered a bill of particulars on the operation of both Blue Cross plans and hospitals, suggesting widespread neglect in the control of hospital utilization and costs. In the following months, official investigations were launched in several States on the whole question of hospital management and economics.<sup>1</sup>

Another quotation from the same source is even more pointed.

Finally, there is the question of hospital operating costs, which have obvious importance for the general public. In recent years, public concern about this has become an overriding issue. Not only has there been widespread popular reaction to the sharp rises in hospital costs, but the channel of expression of this action has been widened through a separate but closely related social movement: hospital insurance. . . .<sup>2</sup>

The reason for such concern about hospital expenses is to be found in the demand for hospital care. Dr. Robertson points out that throughout a wide range of prices, demand is highly "inelastic." <sup>3</sup> Thus, price changes cause little variation in the quantity of care which buyers are

---

<sup>1</sup>Ibid., p. 401.

<sup>2</sup>Ibid., p. 403.

<sup>3</sup>Robert L. Robertson, The Market for Hospital Care (Reprint Series No. 29; Madison: The Industrial Relations Research Center of the University of Wisconsin) reprinted from Hospital Administration, Vol. 7, No. 1 (Winter, 1962), pp. 45f.

willing and able to purchase. Any individual hospital as well as all hospitals in the aggregate face this demand situation although the coefficients of elasticity would not necessarily be identical.

There are at least two explanations for the inelasticity. First, medical care is so important to the purchaser that price tends to be of lesser importance to the decision to purchase the service than it is for many other goods or services. Second, the public, through a governmental agency or organized charity, will pay for the care if the patient is unable to do so. The public's willingness to assume such expense is based not only upon humanitarian motives, but also upon self-interest in protecting itself from communicable diseases.

Because of the public concern about the costs of medical care generally and hospital care in particular, suggestions have been made as to how existing patterns of care and payment therefor ought to be modified. For example, ". . . we are suggesting that any effective public control over expenditures for hospital service by the population as a whole requires a conscious and deliberate control over the supply of beds in a state."<sup>1</sup>

Mr. Roemer, in another article concerning what he identifies as the inadequate total number of physicians and their maldistribution throughout the nation, suggests, "greater investment in the training of physicians would cost the nation money, but it might yield great savings in the

---

<sup>1</sup>Max Shain and Milton I. Roemer, p. 408.

national expenditures for hospital care, not to mention improvements in the health services generally."<sup>1</sup>

Controversy over payment for hospital and medical care has been focused in recent years upon the costs of health care insurance and the various health care plans submitted to the United States Congress.<sup>2</sup> This controversy has been concerned not only with individual rates which have risen sharply in post World War II years,<sup>3</sup> but in addition with the magnitude of the total cost to the nation.

In view of the widespread interest in hospital costs and the implications of these costs, it would seem that study would be given to such cost data as are available. However, few studies appear to have been made.

---

<sup>1</sup>Milton I. Roemer, Hospital Utilization and the Supply of Physicians (Ithaca, New York: Graduate School of Business and Public Administration, Cornell University) reprinted from The Journal of the American Medical Association, Vol. 178 (Dec. 9, 1961), p. 993.

<sup>2</sup>"Health Care for the Aged: Here Are The Two Plans," U. S. News and World Report (Feb. 24, 1964), p. 46.

"Problem of Medical Costs - What Can Be Done About It," U. S. News and World Report (May 25, 1964), p. 72.

"Why It Costs More to Insure Against Illness," U. S. News and World Report (Jan. 31, 1958), p. 83.

E. J. Faulkner, Appendices in connection with "Statement on Proposed Social Security Amendments on Behalf of the Health Insurance Association of America Before the Ways and Means Committee, U. S. House of Representatives, June 24, 1958" (New York: Health Insurance Association of America). (Mimeographed.)

<sup>3</sup>Elizabeth A. Langford, "Medical Care in the Consumer Price Index, 1936-56," (Washington: Government Printing Office) reprinted from the Monthly Labor Review (September, 1957).



Such studies as have been made generally treat some limited group of hospitals. One dealt with hospitals having 500 or more beds.<sup>1</sup> The data of this study appear to be those for one year. By the use of simple correlation, the investigators attempted to establish a relationship between costs and factors, e.g., admissions, which may be thought to influence costs.

Another, and perhaps the most complete study available, is one which, although monumental in its comprehensiveness, is limited to the hospitals of Michigan.<sup>2</sup> Designed as a pilot study, it required that much attention be given to the development of appropriate investigative methods. Typical of such problems dealt with was that of determining a probability sample when choosing the hospitals and patients' records for investigation. The basic analytical technique was cross sectional multiple regression.

An extension to the entire nation of some aspects of the Michigan study was recently published by the American Medical Association.<sup>3</sup> Like the Michigan study, it is concerned with the cost of medical care in general and deals with hospital costs as a component of total medical care. The

---

<sup>1</sup>Charles U. Letourneau and Melinda Ulveling, "Hospital Costs - Some Influential Factors," Hospital Management (Nov., and Dec., 1960), pp. 36f. and pp. 40f.

<sup>2</sup>Walter J. McNerney et al, Hospital and Medical Economics (2 vols.; Chicago: Hospital Research and Educational Trust), 1962.

<sup>3</sup>Commission on the Cost of Medical Care, The Report of the Commission on the Cost of Medical Care. Vol. I: General Report. Vol. IV: Changing Patterns of Hospital Care (4 vols.; American Medical Association, 1964, n.p.)

methodology used is primarily that of a cross sectional analysis by multiple regression techniques to derive a demand function for medical care and incidentally for hospital care. The data used are the result of a survey conducted by the National Opinion Research Center in 1958 to determine family medical expenditures.

The explanatory variables included family income, age, size and education, location, price of care and per cent of bill covered by insurance. For medical care generally, income was the most significant economic variable while the insurance variable was the most significant in demand for hospital care.

Neither the static demand curve of economic theory with its coefficient of price elasticity was computed nor was the coefficient of income elasticity.

In both the Michigan and the American Medical Association studies costs were dealt with indirectly. Attention was directed to (1) the changing nature of diseases treated in the three years 1946, 1954 and 1961, and (2) a description of the quality change in medical care of hospitalized illnesses in 1946 and 1961. Economic cost curves were not computed.

In 1954, the Commission on the Financing of Hospital Care published its report.<sup>1</sup> Volume one of the report deals with some of the factors dealt

---

<sup>1</sup>John H. Hayes (ed.) Factors Affecting the Costs of Hospital Care. Vol. I of the Report of the Commission on Financing of Hospital Care in the United States (3 vols.; New York: The Blakiston Co., Inc., 1954).

with in the following pages of this dissertation. However, that study was for the period 1938 through 1953 and the emphasis was upon finding or suggesting ways by which increasingly costly hospital care could be purchased by the consumer. The study was largely descriptive. Methodology consisted of tabular cross classification of data. Causes of changes in costs were deduced from the material shown in the cross classifications.

A cross sectional study,<sup>1</sup> published in 1961, of sixty hospitals attempted to obtain short-run and long-run average total cost curves as well as short-run marginal cost curves. Data observed were monthly costs for the 60 hospitals during 1957. To supplement the long-run cost information computed, the costs of Gary [Indiana] Methodist Hospital for the period 1956 through 1958 were used in computing short-run cost curves. Multiple linear regression equations were found for predicting departmental expenses and total expenses for the hospital.

Essentially the same approach, cross sectional, was used by Dr. Ingbar in her study of the 1958 costs of 72 Massachusetts hospitals.<sup>2</sup>

---

<sup>1</sup> Paul J. Feldstein, An Empirical Investigation of the Marginal Cost of Hospital Services (Chicago: Graduate Program in Hospital Administration, University of Chicago, 1961).

<sup>2</sup> Mary Lee Ingbar, A Statistical Study of Differences in Hospital Costs: Cost Functions for 72 Massachusetts Hospitals (Graduate School of Public Administration, Harvard University, n.d.) (Mimeographed.)

Detailed statements of methodology for the present study are made in a later section of chapter one and at appropriate points in chapters five and six. However, in general, this study differs from those mentioned above in the following respects. First, time series of costs reported by all short-term general non-federal hospitals rather than cross sectional sample data are used. Also, unlike any of the others, this study attempts to obtain the static price-output demand curve of economic theory. In addition, an attempt is made to ascertain the effects of shifts in both demand and cost curves on price of hospital care.

There are some differences also in findings. The Feldstein study shows that average long-run costs decline as size of hospital increases while the Ingbar study shows little difference in cost as size varies. This study's findings are similar to those of the Ingbar study.

Demand is found to have become more elastic when the data are adjusted for socio-economic changes than it is generally thought to be. Although the variables are defined differently, there is general agreement in the predicting equations computed in this and the American Medical Association studies.

Since 1946, the American Hospital Association has conducted an annual survey of institutions listed by it as hospitals. The institutions surveyed included both members and non-members of the Association. The survey includes data relating to the capacity, utilization, expenses and assets of these institutions.



### Purpose

It is the purpose of this study to examine the data reported by the annual hospital survey and other relevant data concerning the general economy for the following ends.

1. Derive a statistical demand function for hospital care.
  - (a) Determine, if possible, how and why it shifted, if it did shift.
2. Derive statistical cost functions for providing hospital care.
  - (a) Determine, if possible, how and why they shifted, if any shifts did occur.
3. Draw implications from the results obtained in pursuit of the foregoing purposes for the management of hospitals. These implications will be of a dual nature, (a) those involving only the internal policies and procedures of a hospital, and (b) those that collectively involve a group of hospitals.

### Statement of Hypothesis

Although hospital costs, and consequently the prices for service which are based on these costs, appear to be determined by a complicated interaction of many factors, there seems to be no evidence to indicate that they are not amenable to economic laws just as are other economic phenomena. Therefore, it is the working hypothesis of this study that the changes in hospital costs are explained both by shifts in the demand for hospital care and by shifts in the costs incurred in supplying such care.

Shifts in demand could be expected to occur because of certain societal and economic changes. Specifically, these changes involve increases in population, employment, net civilian salaries and wages, median income

of spending units and hospitalization insurance coverage carried by the population.

The total amount of hospital costs may be expected to be influenced by such factors as (a) size of hospital, expressed in bed capacity, (b) type of ownership, hereafter referred to as control, (c) service, (d) accreditation, (e) admissions, (f) average daily census, (g) average length of stay, (h) personnel, (i) assets, and (j) price level changes. Admissions and average daily census should affect total expenses by causing a point to move along the cost curve. The other factors should affect the level of the curve itself.

### Methodology

Some explanation should probably be made as to why only short-term, non-federal general and other special hospitals are included in this study. First, this group of hospitals is the largest single category of hospitals in the United States constituting approximately 75 per cent of all hospitals.<sup>1</sup> Although these hospitals contain less than 40 per cent of all beds and have an average of only about one-third of the total number of patients hospitalized on any day, approximately 90 per cent of all patients are admitted to them. Second, it could reasonably be assumed that federal hospitals and non-federal long-term hospitals, such as psychiatric and tuberculosis, could be expected to have different characteristics which would unduly complicate the investigation. Finally, inasmuch as the

---

<sup>1</sup>"Text Table I, " Hospitals, Journal of the American Hospital Association, Vol. 36, Part 2 (August 1, 1962), p. 404.

scope of the study must be circumscribed within the purview of limited resources, it seems reasonable to deal with those hospitals which are most numerous and which affect the greatest number of people.

If the independent variables are indeed causally related to the dependent variables, one would expect changes in the independent variables to result in shifts in the dependent variables. Such changes could be determined in a crude manner by simple visual inspection of the amounts of change occurring in the different variables, then making comparisons among the various amounts of change. These comparisons could most easily be made by determining the percentage change in each variable with respect to a base year, then examining the relationships among the per cent change figures.

Therefore, the various tables of chapters two, three and four show not only the observations of the variables, but in addition contain sections showing per cent change figures. The accompanying text in those chapters discusses the changes and their percentage relationships.

The relevant data of chapters two, three and four are further combined and analyzed in chapter five. An effort is made to show the simple demand curve relating output to price of service. Patient-days and admissions are used as the measure of output. Price is adjusted for changes in population and income. The curve is shown in two parts, 1946-1952 and 1953-1960. A comparison of these two curves is made in order to detect shifts in demand.

After the simple analysis of demand is completed, a least squares multiple regression demand equation is obtained for prediction purposes. Also, the partial regression coefficients are obtained in order to ascertain the net influence of each independent variable in the multiple regression equation.

Ideally, a statistical demand function should have been computed for each sub-set of hospitals. However, the data are in such form that this is not possible. Consequently, total industry demand is computed.

In chapter six, short-run statistical cost functions are obtained by analysis of the relevant information of chapters two, three and four. Cost functions are computed for the total industry grouped into the various categories of size. Because of the nature of the data, average total cost functions are computed. Little additional useful information would be yielded by total and marginal cost functions, and the data are too limited to permit computation of long-run cost functions. Hence, these three cost functions are not computed. Nevertheless, the various cost functions computed should yield some useful information for purposes of managerial control.

Detailed explanations of the techniques of analysis are presented in chapters five and six along with the presentation of the results of the analysis.

### Data

Some question may be raised as to the comparability of the data. Even though fairly precise definitions of size, control, service and length of



stay are used, there may be considerable variation among the hospitals classified into any group. For example, short-term, general hospitals presumably provide the general run of services required in a community hospital for patients whose average length of stay is less than 30 days. However, one such general hospital may have a much larger average length of stay than another. This suggests that one may actually be specializing to a considerable extent. The author knows of one general hospital which had at one time the majority of its admissions receiving obstetrical or ear, nose and throat care. Such specialization results in non-homogeneous units in each classification.

There is really no way of estimating from data available the seriousness of this lack of homogeneity. Therefore, for the purposes of this study, it is disregarded completely. No attempt is made to determine or correct such distortion.

For some years, data were not available for some of the variables. See, for example, Tables IV-35, IV-36, IV-37, plant assets. Where such omissions occurred, the assumption was made that such change as was occurring was at a constant amount. Hence, a straight line interpolation was made and the computed values were used in subsequent computations. To illustrate, in Table IV-35, plant assets of voluntary hospitals, no value was reported for 1959. Observe the "Under 25 Beds" category. Between the contiguous figures, the midpoint, \$44,609, was computed and used in subsequent computations.

This lack of full information became rather serious with respect to proprietary and governmental hospitals inasmuch as no data were reported for the larger size categories -- 200-299, 300-499, 500 and over -- until 1957. The data shown in the tables for the 100-199 beds group is really for "100 and over" except for the years 1957 and 1960. No reliable method by which these values could be distributed to the larger size groupings seemed to be available. Consequently, they are not distributed. From 1953, analysis of proprietary and governmental hospitals' data in the larger size groupings is combined into the one classification -- 100 beds and over.

Finally, one other problem with respect to data was encountered. From 1946 when the surveys were begun through 1952, there were four size classifications -- Under 50 beds, 50-99 beds, 100-249 beds and 250 beds and over. Beginning in 1953, the size groups were revised with only one of the old sizes, 50-99, being retained. Rather than attempt to try to reclassify either set of data, 1946-1952 or 1953-1960, into the same classes as the other and probably introduce error, it seemed better to leave the data as reported and seek explanations for the variation in each set.

## CHAPTER II

### Selected Economic and Social Changes

In this and the two following chapters, the information required to test the hypothesis is developed in considerable detail. The general rationale for the inclusion of each type of information has already been presented in chapter one. Therefore in chapters two and three, the data are presented with accompanying descriptive comments. Chapter four contains additional data and descriptive comments; in addition, an effort is made to relate the three classes of material presented in these three chapters. Thus, not only data with descriptive statements are presented in chapter four, but also there is discussion of the significance of the various changes and some explanation of the causes of the changes revealed in the data. The statistical procedures used in testing the hypothesis are presented in chapters five and six.

Although not all the data shown in chapters two, three and four are used in the analyses of chapters five and six, they were useful in preliminary analyses. Also they help to define the milieu, thereby providing background against which the analyses may be viewed.

In this chapter, specific information dealing with changes in population, employment, price levels, capital accumulation and income is presented.

### Population

Changes in total population between 1946 and 1960 are shown in Table II-1. Also shown is the percentage change for each year from 1946.

TABLE II-1.-Estimated total population (in thousands), and per cent change from 1946, as of July 1, 1946-1960, inclusive<sup>a</sup>

Year	Number of people	% change from 1946
1946	141,389	0
1947	144,126	1.9
1948	146,631	3.7
1949	149,188	5.5
1950	151,683	7.3
1951	154,360	9.2
1952	157,028	11.1
1953	159,636	12.9
1954	162,417	14.9
1955	165,270	16.9
1956	168,176	18.9
1957	171,198	21.1
1958	174,054	23.1
1959	177,103	25.3
1960	179,323	26.8

<sup>a</sup>Source: Figures for 1946-1949 and 1951 are taken from U. S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1957 (Washington, 1960), p. 8; Figures for 1950, 1952-1959 are from U. S. Bureau of the Census, Statistical Abstract of the United States: 1960 (81st edition; Washington, 1960), p. 22; 1960 figures are from U. S. Bureau of the Census, Statistical Abstract of the United States: 1961 (82nd edition; Washington, 1960), p. 26.

Because of computer capacity limitations only the aggregate figures are used in relating population to other data. However, during the time period encompassed by the study some rather striking changes occurred in other characteristics of population. One interesting change was in the age distribution.

## Age

Total population increased 26.8 per cent from 1946 to 1960. All age groups experienced at least some growth in absolute numbers although the percentage increase was rather small in the "15 through 24" category and almost nil in the "25 through 34" group. While the "35 through 44" and "45 through 54" groups experienced growth somewhat less than the total population growth, the "55 through 64" group grew at almost the same rate as did the total population. The really rapid growth changes occurred, however, in the "Under 15" and the "65 and Over" age groups.

If a graph of the population distributed by age groups were drawn for 1946, it would be fairly well described by a straight line having a rather steep negative slope. However, by 1960 the effects of the sharp increase in the extreme age groupings require a curve more in the shape of a parabola.

Estimates of total population classified by age are shown in Table I-A of Appendix I.

## Race

Although both the white and non-white segments of the population have grown rather rapidly, there have not been any large changes in the racial composition of the total population. As one can observe in Appendix I, Table I-C, there has been a small, but steady, increase in the non-white component as a per cent of the total population with a corresponding decrease in the white segment.



The per cent change from 1946 to 1960 was about 50 per cent greater in the non-white component than in the white even though the white component grew somewhat more rapidly during the early years of the period. The yearly growth rate for the white component has been rather constant while the non-white yearly growth rate has increased sizeably.

### Sex

Changes in the sex characteristics of the population during the period of interest were not large. In 1946, the population was almost equally composed of males and females. Slight changes took place during the ensuing years so that in 1960, 49.3 per cent of the population was male while females composed the remaining 50.7 per cent. The percentage increase from 1946 to 1960 was slightly larger among the female segment of the population than among the male. The female yearly rate of increase was also somewhat larger than the male as well as being less variable. Detailed sex characteristics are presented in Appendix I, Table I-D.

### Age, Sex, Race

Reclassification of the population by age, sex, and race serves to reiterate the findings derived from other classifications.

The white male population declined from 44.3 per cent of the total population in 1946 to 43.7 per cent in 1960. Although the white under 20 years age group increased from 14.4 per cent to 17.0 per cent, all other white male age groups declined as a per cent of total population.

The only non-white male age group showing a decline was the 20-34 group which dropped from 1.3 per cent of total population in 1946 to 1.0 per cent in 1960. Non-white males as a whole increased from 5.2 per cent in 1946 to 5.6 per cent of the total population in 1960.

The white female "Under 20" as well as the "65 and over" age groups both increased although all white females as a per cent of the total population decreased slightly from 45.2 per cent of the population in 1946 to 44.9 per cent in 1960. The only non-white female group failing to show an increase was the 20-34 group. Total non-white females increased from 5.3 per cent to 5.9 per cent during the period.

Percentage increases were greater among the female population than among the male; and, for both males and females, the non-white population grew faster than the white population. Sharp increases among males and females both white and non-white occurred in the "Under 20" age group and in the "65 and over" age group. As one would expect, the annual rates of change were also greatest in these same two age groups. Appendix I, Tables I-E, I-F, I-G, and I-H contain the detailed information concerning population classified according to age, sex, and race.

#### Marital Status

Relative changes in the population 14 years old and older classified according to marital status were rather minor. The single group dropped from 25 per cent of total population in 1947 to 22.5 per cent in 1960.

The married group increased from 65.2 per cent to 67.0 per cent while the divorced group increased from 1.8 per cent to 2.4 per cent. The widowed group was practically unchanged as a per cent of the total population. There were increases in number of population in all classifications. While the per cent increase in the total population 14 years of age and over was at the simple rate of 1.27 per cent, the single group after declining for several years increased enough in the later years of the period to show a simple average rate of gain of 0.2 per cent. The married, widowed and divorced groups increased 1.60, 1.51 and 3.36 respectively.

Although no further pertinent information is gained by analysis of marital status by sex, Appendix I, Table I-I contains information concerning marital status of the population classified by sex, while Table I-J contains information concerning marital status of the total population.

### Urbanization

The long run movement of the American population from farms to the cities continued during the period of interest. In 1950, 63.8 per cent of the population lived in urban areas and had increased to 69.9 per cent by 1960. The change is shown in Table II-2.

Total population increased 18.5 per cent from 1950 to 1960, but the increase in urbanization amounted to 29.3 per cent while rural population declined in the amount of 0.8 per cent.



TABLE II-2.-Estimates of total U. S. population (in thousands) and per cent distribution classified by urban or rural location<sup>a</sup>

Year	Total population	Urban		Rural	
		Pop.	% of tot. pop.	Pop.	% of tot. pop.
1950	151,326	96,847	63.8	54,479	36.2
1960	179,323	125,269	69.9	54,054	30.1

<sup>a</sup>Source: U. S. Bureau of the Census, Statistical Abstract of the United States: 1961 (82nd edition; Washington, 1961), p. 22.

### Births, Deaths, Marriages, Divorces

Previous classifications have shown increases in nearly every category of population. However, along with the increase in total population, there has been a striking increase in the birth rate through the mid-fifties followed by somewhat of a decline thereafter. Death, marriage and divorce rates have all exhibited sizeable decreases during the period. Table II-3 shows these rates.

TABLE II-3.-Birth, death, marriage and divorce rates per 1,000 population, 1946-1960 inclusive<sup>a</sup>

Year	Births	Deaths	Marriages	Divorces
1946	23.6	10.0	16.4	4.3
1947	26.0	10.1	13.9	3.4
1948	24.4	9.9	12.4	2.8
1949	24.0	9.7	10.6	2.7
1950	23.6	9.6	11.1	2.6
1951	24.4	9.7	10.4	2.5
1952	24.6	9.6	9.9	2.5
1953	24.5	9.6	9.8	2.5
1954	24.9	9.2	9.2	2.4
1955	24.6	9.3	9.3	2.3

TABLE II-3-Continued

Year	Births	Deaths	Marriages	Divorces
1956	24.9	9.4	9.5	2.3
1957	25.0	9.6	8.9	2.2
1958	24.3	9.5	8.4	2.1
1959	24.1	9.4	8.5	2.2
1960	23.6	9.5	8.5	na

<sup>a</sup>Taken and calculated from: U. S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1957 (Washington, 1960), p. 30; and, U. S. Bureau of the Census, Statistical Abstract of the United States: 1961 (82nd edition; Washington, 1961), p. 48.

<sup>na</sup>Not available.

One of the most striking changes occurring during the years of the study had to do with the place of birth and the kind of medical attendance given the newborn. A rather large percentage, 82.3, of births occurred in hospitals with physicians in attendance in 1946. But by 1960 this percentage had increased to 96.6. Table II-4 shows the change.

#### Physicians

If all hospital care were increased as much as obstetrical care, it would seem that there would have to be an increase in the number of physicians per unit of population. However, this was not the case. In 1949, the first year of this study for which information is available, there were 201,277 civilian physicians gainfully employed or 135 per 100,000 population. While the total number of physicians engaged in the practice of medicine as civilians increased by several thousands,

the rate per 100,000 of population remained almost constant, being 133 in 1959. Table I-K of Appendix I shows the change in number of physicians.

TABLE II-4.-Registered births (in thousands) by type of attendance with percentage distribution, 1946-1960 inclusive<sup>a</sup>

(columns 2, 3 and 5 are rounded independently; therefore, the sum of columns 3 and 5 may differ somewhat from column 2)

Year (1)	Total births (2)	Attended by physician in hospital		Attended by physicians or others not in hospital	
		Births (3)	% of tot. births (4)	Births (5)	% of tot. births (6)
1946	3,289	2,708	82.3	581	17.7
1947	3,700	3,137	84.8	563	15.2
1948	3,535	3,025	85.6	509	14.4
1949	3,560	3,087	86.7	473	13.3
1950	3,554	3,126	88.0	428	12.0
1951	3,751	3,377	90.0	374	10.0
1952	3,847	3,529	91.7	318	8.3
1953	3,902	3,621	92.8	281	7.2
1954	4,017	3,760	93.6	257	6.4
1955	4,047	3,819	94.4	229	5.6
1956	4,163	3,959	95.1	203	4.9
1957	4,255	4,070	95.7	184	4.3
1958	4,204	4,037	96.0	168	4.0
1959	4,245	4,091	96.4	154	3.6
1960	4,258	4,114	96.6	143	3.4

<sup>a</sup>Taken and calculated from: U. S. Bureau of the Census, Statistical Abstract of the United States: 1962 (83rd edition; Washington, 1962), p. 56.

### Population Density

The total land area of the United States changed only slightly during the early years of the period of analysis. However, upon the acqui-



tion of statehood by Alaska and Hawaii the area increased by about one sixth as shown in Table II-5.

TABLE II-5.-Land area in square miles of the United States, 1946-1960<sup>a</sup>

Year	Area	
	Excl. Alaska & Hawaii	Incl. Alaska & Hawaii
1946	2,977,128	2,977,128
1950	2,974,726	2,974,726
1958	2,974,726	3,552,197
1959	2,974,726	3,552,197
1960	2,971,494	3,548,974

<sup>a</sup>Source: U. S. Bureau of the Census, Statistical Abstract of the United States: 1946, 1951, 1952, 1959, 1960, 1961 (67th, 72nd, 73rd, 80th, 81st, 82nd editions; Washington, 1946, 1951, 1952, 1959, 1960, 1961), pp. 3, 5, 5, 160, 160, 161 respectively.

Inasmuch as land area has remained almost constant, the population density has increased at about the same rate as the total population -- slightly over 25 per cent during the 15 years. Population density shown in the following table excludes both Alaska and Hawaii.

TABLE II-6.--Estimated population of the United States per square mile of land area, 1946-1960 inclusive<sup>a</sup>

Year	Population
1946 . . . . .	47.0
1947 . . . . .	48.2
1948 . . . . .	49.1
1949 . . . . .	49.9
1950 . . . . .	50.7
1951 . . . . .	51.6
1952 . . . . .	52.4
1953 . . . . .	53.2
1954 . . . . .	54.2
1955 . . . . .	55.2
1956 . . . . .	56.2
1957 . . . . .	57.2
1958 . . . . .	58.2
1959 . . . . .	59.2 <sup>b</sup>
1960 . . . . .	60.3 <sup>b</sup>

<sup>a</sup>Calculated from: Tables 2 and 8.

<sup>b</sup>Alaska and Hawaii are not included.

### Employment

Among the points of interest concerning employment is the growth of the labor force, the number unemployed, the movement of wages and changes in productivity. These will all be examined in this section.

### Employment Status

Except for the agricultural labor force, every segment of the American non-institutional population 14 years old and older increased in terms of absolute numbers from 1946 to 1960. During the 15-year period the total non-institutional population increased 17.7 per cent

while the total civilian labor force increased 22.8 per cent and those not in the labor force increased only 14.7 per cent. These different growth rates result in a different percentage distribution of the total population between the labor force and those not in the labor force for the years involved. Table II-7 shows these data.

The net result of the changes has been that a steadily increasing proportion of the total population has sought employment while there has been a corresponding decrease in the sum of the military forces and those not in the labor force.

Within the labor force itself, some striking changes have occurred. First, although the total labor force experienced growth and the total number of people employed increased by 20.7 per cent, those actually employed declined 1.7 per cent as a per cent of the total labor force. The unemployed portion of the labor force increased 1.7 per cent in the distribution of the total labor force. Second, if the change in the unemployed is considered, there is a cyclical pattern resulting in sizeable growth. Table II-A of Appendix II reveals that, at least from 1950 on, the increase in unemployment was greater among the female work force than among the male; and, by referring to Table II-B in the same appendix, one can see that the female portion of the labor force was growing more rapidly than the male portion.

A third important change is that of the distribution of the total employed labor force between agricultural and non-agricultural employment. The actual number of people in the agricultural labor force



TABLE II-7.-Employment status of the non-institutional population (in thousands of persons 14 years old and older), 1946-1960 inclusive, with per cent distribution and per cent change from 1946<sup>a</sup>

Year	Total non-inst. pop.	Civilian labor force				
		Total	Employed			Unemployed
			Total	Agri.	Non-agri.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Number of people						
1946	106,520	57,520	55,250	8,320	46,930	2,270
1947	107,608	60,168	57,812	8,256	49,557	2,356
1948	108,632	61,442	59,117	7,960	51,156	2,325
1949	109,773	62,105	58,423	8,017	50,406	3,682
1950	110,929	63,099	59,748	7,497	52,251	3,351
1951	112,075	62,884	60,784	7,048	53,736	2,099
1952	113,270	62,966	61,035	6,792	54,242	1,931
1953	115,094	63,815	61,945	6,555	55,390	1,870
1954	116,219	64,468	60,890	6,495	54,395	3,578
1955	117,388	65,847	62,944	6,718	56,225	2,903
1956	118,734	67,530	64,708	6,572	58,135	2,822
1957	120,445	67,946	65,011	6,222	58,789	2,936
1958	121,950	68,647	63,966	5,844	58,122	4,681
1959	123,366	69,394	65,581	5,836	59,745	3,813
1960	125,368	70,612	66,681	5,723	60,958	3,931
Per cent distribution						
1946	b	54.0 <sup>d</sup>	96.1 <sup>e</sup>	15.1 <sup>f</sup>	84.9 <sup>f</sup>	3.9 <sup>e</sup>
1947		55.9	96.1	14.3	85.7	3.9
1948		56.6	96.2	13.5	86.5	3.8
1949		56.6	94.1	13.7	86.3	5.9
1950		56.9	94.7	12.5	87.5	5.3
1951		56.1	96.7	11.6	88.4	3.3
1952		55.6	96.9	11.1	88.9	3.1
1953		55.4	97.1	10.6	89.4	2.9
1954		55.5	94.4	10.7	89.3	5.6
1955		56.1	95.6	10.7	89.3	4.4
1956		56.9	95.8	10.2	89.8	4.2
1957		56.4	95.7	9.6	90.4	4.3
1958		56.3	93.8	9.1	90.9	6.8
1959		56.3	94.5	8.9	91.1	5.5
1960		56.3	94.4	8.6	91.4	5.6

TABLE II-7.-Continued

Not in labor force				Military
Total	Keeping house	In school	Other	
(8)	(9)	(10)	(11)	
Number of people				
45,550	31,020	6,360	8,170	3,450
45,850	32,441	6,446	6,962	1,590
45,733	32,850	6,178	6,706	1,457
46,051	33,067	6,093	6,891	1,617
46,181	33,058	6,197	6,926	1,649
46,092	33,105	5,829	7,159	3,099
46,710	33,334	6,040	7,335	3,594
47,732	34,225	6,034	7,675	3,547
48,401	33,893	6,310	8,198	3,350
48,492	33,722	6,569	8,201	3,049
48,348	33,399	6,593	8,356	2,856
49,699	33,892	7,047	8,759	2,800
50,666	34,233	7,524	8,909	2,637
51,420	34,487	7,761	9,172	2,552
52,242	34,543	8,162	9,538	2,514
Per cent distribution				
42.8 <sup>d</sup>	c	c	c	3.2 <sup>d</sup>
42.6				1.5
42.1				1.3
42.0				1.4
41.6				1.5
41.1				2.8
41.2				3.2
41.5				3.1
41.6				2.9
41.3				2.6
40.7				2.4
41.3				2.3
41.5				2.2
41.7				2.0
41.7				2.0



TABLE II-7.-Continued

Year	Total non- inst. pop.	Civilian labor force				
		Total	Employed			Unemployed
			Total	Agri.	Non-agri.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Per cent change from 1946						
1946	0.0	0.0	0.0	0.0	0.0	0.0
1947	1.0	4.6	4.6	- 0.8	5.6	3.8
1948	2.0	6.8	7.0	- 4.3	9.0	2.4
1949	3.1	8.0	5.7	- 3.6	7.4	62.2
1950	4.1	9.7	8.1	- 9.9	11.3	47.6
1951	5.2	9.3	10.0	-15.3	14.5	- 7.5
1952	6.3	9.5	10.5	-18.4	15.6	-14.9
1953	8.0	10.9	12.0	-21.2	18.0	-17.6
1954	9.1	12.1	10.2	-21.9	15.9	57.6
1955	10.2	14.5	13.9	-19.3	19.8	27.9
1956	11.5	17.4	17.1	-21.0	23.9	24.3
1957	13.1	18.1	17.1	-25.2	25.3	29.3
1958	14.5	19.3	15.8	-29.8	23.8	106.2
1959	15.8	20.6	18.7	-29.9	27.3	68.0
1960	17.7	22.8	20.7	-31.2	29.9	73.2
Average	1.26	1.63	1.48	-2.23	2.14	5.23

<sup>a</sup>Taken and calculated from: U. S. Bureau of the Census, Statistical Abstract of the United States: 1962 (83rd edition; Washington, 1962), p. 215.

<sup>b</sup>This column represents 100 per cent for all years.

<sup>c</sup>The percentages for these columns were not computed since they are not particularly pertinent to this study.

<sup>d</sup>The figures are percentages of total non-institutional population shown in Column 2.

<sup>e</sup>These columns show percentages of total civilian work force, Column 3.

<sup>f</sup>Percentages of Column 4, total employed, are shown here.

TABLE II-7.-Continued

Not in labor force				Military
Total	Keeping house	In school	Other	
(8)	(9)	(10)	(11)	(12)
Per cent change from 1946				
0.0	0.0	0.0	0.0	
0.7	4.6	1.4	-14.8	
0.4	5.9	-2.9	-17.9	
1.1	6.6	-4.2	-15.7	
1.4	6.6	-2.6	-15.2	
1.2	6.7	-8.3	-12.4	
2.5	7.5	-5.0	-10.2	
4.8	9.7	-5.1	-6.1	
6.3	9.3	-0.8	0.3	
6.5	8.7	3.3	0.4	
6.1	7.7	3.7	2.3	
9.1	9.3	10.8	7.2	
11.2	10.4	18.3	9.0	
12.9	11.2	22.0	12.3	
14.7	11.4	28.3	16.7	
1.05	0.81	2.02	1.19	

decreased while there was an increase in numbers in the non-agricultural portion. As percentages of the total employed civilian labor force, agricultural workers dropped from 15.1 per cent in 1946 to 8.6 per cent in 1960 while for the same time period the non-agricultural workers increased from 84.9 per cent to 91.4 per cent. The percentage decline in number of agricultural workers was 31.2 per cent while non-agricultural workers increased 29.9 per cent in actual numbers.

#### Wage and Salary Income

If it is assumed that there were no change in the earnings per person, income from wages and salaries could be expected to rise at least 20 per cent between 1946 and 1960 since the total number of people employed increased by this amount. But, the actual increase was much greater as shown in Table II-8.

The increase in wage and salary income was almost four times as large as could be expected to result solely from the increase in size of work force. The percentage increase in income expressed in current dollars was twice as large as the percentage increase shown for income change measured in constant dollars. One would infer, therefore, by observing only the current dollar changes that income had increased more than eight times as much as would be expected from the change in size of labor force.

TABLE II-8.-Salary and wage income (in millions) in current and constant dollars (1947-49=100), with per cent change from 1946<sup>a</sup>

Year	Net civ. sal. & wages	% change from 1946	Net civ. sal. & wages in constant \$ (1947-49=100)	% change from 1946
1946	104,018	0.0	124,722	0.0
1947	124,690	19.9	130,565	4.7
1948	136,999	31.7	133,268	6.9
1949	136,586	31.3	134,171	7.6
1950	149,191	43.4	145,127	16.4
1951	171,643	65.0	154,633	24.0
1952	184,540	77.4	162,590	30.4
1953	198,475	90.8	173,492	39.1
1954	197,644	90.0	172,164	38.0
1955	214,074	105.8	186,964	49.9
1956	232,839	123.8	200,378	60.7
1957	245,855	136.4	204,538	64.0
1958	247,375	137.8	200,304	60.6
1959	268,655	158.3	215,614	72.9
1960	283,771	172.8	224,325	79.9

<sup>a</sup>Calculated from: U. S. Department of Commerce, Office of Business Economics, Survey of Current Business, National Income Number, Vol. 42, No. 7 (Washington: July, 1962), p. 6; and U. S. Department of Commerce, Office of Business Economics, National Income: 1954 Edition (Washington: 1954), p. 163.

### Personal Income

Although not increasing as rapidly as wage and salary income, personal income increased almost twice as rapidly as total population, about 2.5 times as fast as the labor force and about three times as fast as the total non-institutional population 14 years old and older. Inasmuch as wage and salary income constitutes roughly two-thirds of personal income, it is apparent that other types of income grew considerably



less rapidly, if at all. Table II-C of Appendix II shows the change in personal income.

#### Average Income of Spending Units

Another measure of the change in income for the period of time involved in this study may be obtained by observing the change occurring in average income. The mean and median income for professional and semi-professional workers as well as for service and unskilled workers increased both in current dollars and in constant dollars.

The real increase, measured in constant dollars, in the mean income per spending unit of professional workers was of about the same magnitude as the increase in population and labor force. However, the median income increased more rapidly than did total population, 43.1 per cent and less than 28.5 per cent respectively. It also increased more than the 22.8 per cent increase in total labor force from 1946 through 1960.

These changes indicate that more of the professional and semi-professional workers spending units are obtaining larger incomes while the extremely large incomes constitute a smaller proportion of total income obtained by this category of workers.

Just the opposite results occurred among the unskilled and service workers. Their mean income increased 40.3 per cent while the median income increased only 31.2 per cent. So, although this entire category of workers received larger incomes through the years, some increased their incomes sufficiently large enough to raise the entire category's mean above the median.



One would expect that while population increased, total personal income would also increase. However, this could occur even if the mean and median incomes remained constant. For the period of time under study, the mean and medians both increased while population also increased. It follows, then, that there must necessarily have been a much larger percentage increase in total income than in total population. This has been shown in the two preceding sections to be true.

Table II-9 shows the yearly changes in mean and median income of spending units by occupational classification. Table II-10 shows median income for all spending units.

### Productivity

In order for the economy to sustain the increasingly large wage and salary payments, one would expect that there would be a corresponding increase in productivity. Table II-10 shows that the index of productivity for the entire economy increased slightly in excess of 50 per cent. The large increase in agricultural productivity is explained partially by movement of labor from the agricultural to the non-agricultural segment of the economy as well as by technological improvements, increased capital investments, et cetera.<sup>1</sup>

---

<sup>1</sup>U. S. Department of Commerce, Office of Business Economics, National Income (1954 Edition; Washington: U. S. Government Printing Office, 1954), pp. 2-4.

TABLE II-9.-Mean and median income in current and constant dollars (1947-49=100) of spending units by occupational groups, 1947 to 1960; with per cent change from 1947<sup>a</sup>

Year  (1)	Professional and semi-professional			
	Current dollars (2)	% change from 1947 (3)	Constant dollars <sup>b</sup> (4)	% change from 1947 (5)
Mean				
1947	5,450	0.0	5,707	0.0
1948	5,140	-5.7	5,000	-12.4
1949	5,350	-1.8	5,255	- 7.9
1950	5,630	3.3	5,477	- 4.0
1951	6,020	10.5	5,423	- 5.0
1952	6,670	22.4	5,877	3.0
1953	6,790	24.6	5,935	4.0
1954	7,380	35.4	6,429	12.7
1955	8,140	49.4	7,109	24.6
1956	7,770	42.6	6,687	17.2
1957	8,150	49.5	6,780	18.8
1958	8,270	51.7	6,696	17.3
1959	8,520	56.3	6,838	19.8
1960	9,090	66.8	7,186	25.9
Median				
1947	4,000	0.0	4,188	0.0
1948	4,000	0.0	3,891	- 7.1
1949	4,000	0.0	3,929	- 6.2
1950	4,500	12.5	4,377	4.5
1951	4,500	12.5	4,054	- 3.2
1952	5,310	32.8	4,678	11.7
1953	5,540	38.5	4,843	15.6
1954	6,020	50.5	5,244	25.2
1955	6,250	56.2	5,459	30.3
1956	6,250	56.2	5,379	28.4
1957	7,000	75.0	5,824	39.1
1958	7,450	86.2	6,032	44.0
1959	7,270	81.8	5,835	39.3
1960	7,580	89.5	5,992	43.1

<sup>a</sup>Taken and calculated from: U.S. Bureau of the Census, Statistical Abstract of the United States: 1962 (83rd edition; Washington, 1962), p. 337.

<sup>b</sup>Constant dollars were obtained by dividing current dollars by the Consumers' Price Index, All Items, of Table 15, p. 29.

TABLE II-9.-Continued

Unskilled and service			
Current dollars (6)	% change from 1947 (7)	Constant dollars <sup>b</sup> (8)	% change from 1947 (9)
Mean			
1,900	0.0	1,990	0.0
2,280	20.0	2,218	11.5
2,200	15.8	2,161	8.6
2,350	23.7	2,286	14.9
2,320	22.1	2,090	5.0
2,620	37.9	2,308	16.0
2,760	45.3	2,413	21.3
2,990	57.4	2,605	30.9
2,840	49.5	2,480	24.6
3,250	71.1	2,797	40.6
3,210	68.9	2,671	34.2
3,190	67.9	2,583	29.8
3,320	74.7	2,665	33.9
3,530	85.8	2,791	40.3
Median			
1,750	0.0	1,832	0.0
2,100	20.0	2,043	11.5
2,100	20.0	2,063	12.6
2,100	20.0	2,043	11.5
2,100	20.0	1,892	3.3
2,470	41.1	2,176	18.8
2,530	44.6	2,212	20.7
2,810	60.6	2,448	33.6
2,540	45.1	2,218	21.1
3,000	71.4	2,582	40.9
2,850	62.9	2,371	29.4
2,840	62.3	2,300	25.5
2,950	68.6	2,368	29.3
3,040	73.7	2,403	31.2

TABLE II-10.-Median income of all spending units, 1947 to 1960<sup>a</sup>

Year	Median Income
1946	\$ na
1947	2,530
1948	2,840
1949	2,700
1950	3,000
1951	3,200
1952	3,430
1953	3,780
1954	3,700
1955	3,960
1956	4,250
1957	4,350
1958	4,400
1959	4,880
1960	5,100

<sup>a</sup>Source: U. S. Bureau of the Census, Statistical Abstract of the United States: 1957, 1959, 1963 (78th, 80th, 84th editions; Washington, 1957, 1959, 1963).

"Spending unit" is defined as all persons living in the same dwelling and belonging to the same family who pool their incomes to meet their major expenses; a spending unit may consist of only 1 person.



TABLE II-11 .-Indexes of real output per man-hour for the private economy: 1947 to 1960<sup>a</sup>

Year	Total economy		Farm		Non-farm	
	Index	% change from 1947	Index	% change from 1947	Index	% change from 1947
1947	96.7	0.0	90.5	0.0	97.5	0.0
1948	100.2	3.6	107.1	18.3	99.4	1.9
1949	103.1	6.6	102.2	12.9	103.3	5.9
1950	110.4	14.2	116.2	28.4	108.8	11.6
1951	113.2	17.1	114.5	26.5	110.6	13.4
1952	115.7	19.6	124.5	37.6	112.0	14.9
1953	120.4	24.5	138.6	53.1	115.1	18.1
1954	122.6	26.8	148.3	63.9	116.9	19.9
1955	128.0	32.4	153.5	69.9	121.9	25.0
1956	128.3	32.7	156.4	72.8	121.5	24.6
1957	133.0	37.5	166.7	84.2	125.2	28.4
1958	136.3	41.0	186.9	106.5	127.4	30.7
1959	142.3	47.2	185.4	104.9	133.1	36.5
1960	145.5	50.5	195.8	116.4	135.7	39.2

<sup>a</sup>Taken and calculated from: U. S. Bureau of the Census, Statistical Abstract of the United States: 1961 (82nd edition; Washington, 1961), p. 217.

### Price Level

Along with the increase in population, work force and income there was an accompanying increase in both wholesale and consumers' prices.

### Consumers' Prices

Consumers' prices, as measured by the Consumers' Price Index, increased approximately 50 per cent from 1946 to 1960 making many of the gains in economic growth during this period more apparent than real. Table II-12 shows the change in consumers' prices.

TABLE II-12.-Consumers' price indexes for all items and medical care, 1946-1960 (1947-49=100)<sup>a</sup>

Year	All items	Medical care
1946	83.4	87.7
1947	95.5	94.9
1948	102.8	100.9
1949	101.8	104.1
1950	102.8	106.0
1951	111.0	111.1
1952	113.5	117.2
1953	114.4	121.3
1954	114.8	125.2
1955	114.5	128.0
1956	116.2	132.6
1957	120.2	138.0
1958	123.5	144.6
1959	124.6	150.8
1960	126.5	156.2

<sup>a</sup>Source: U. S. Bureau of the Census, Statistical Abstract of the United States: 1962 (83rd edition; Washington, 1962), p. 348; and, U. S. Congress, Joint Economic Committee, 1957 Historical and Descriptive Supplement to Economic Indicators, 85th Congress, 1st Session, 1957, p. 53.

The increase in cost of medical care was greater than the general increase in prices. Although the medical care component of the all items index measures room rates as the only direct item of hospital cost, hospital costs are measured indirectly through hospitalization insurance costs. This indirect measure may be subject to somewhat of a time lag but in the long run should be quite indicative of changes in cost.<sup>1</sup>

<sup>1</sup>Some question may be raised concerning how accurately the Consumers' Price Index measures change in all consumers' prices. The sample for this index is taken from a universe containing about

## Wholesale Prices

Movement of wholesale prices was quite similar to that of consumers' prices. The largest increases occurred at the end of World War II and during the first year of the Korean War, 1950-51. Table II-13 presents an index of wholesale prices.

## Capital Accumulation

Accompanying the growth of population, work force and productivity, annual capital expenditures increased nearly twice. Much of this expenditure, particularly during the early years of the period, was for expanded capacity. However, expenditures during the last few years were almost entirely for replacement of worn-out or obsolete assets. Table II-14 shows these changes both in current and constant dollars.

---

two-thirds of all city families and nearly 40 per cent of all families. For a detailed presentation of the issues involved see, Kathryn Smul Arnow, The Attack on the Cost of Living Index (New York: The Inter-University Case Program, printed by Polygraphic Company of America, Inc., 1952). The Bureau of Labor Statistics answers some of the criticisms in, "The Revised Consumer Price Index," Monthly Labor Review (February, 1953).

The following items and services are priced in formulating the medical care component: physicians' services; dentists' fees; optometrists' fees; hospital room rates; group hospitalization premium, monthly rate for family; prescriptions; multiple vitamin concentrates; aspirin, unbranded; milk of magnesia. See, Mary S. Bedell, The Consumer Price Index: A Layman's Guide, U. S. Department of Labor, Bureau of Labor Statistics, Bulletin No. 1140 (Washington: U. S. Government Printing Office, 1953), p. 27.



TABLE II- 13.-Indexes of wholesale prices for all commodities and construction materials (1947-49=100)<sup>a</sup>

Year	All commodities	Construction materials
1946	78.7	69.3
1947	96.4	94.0
1948	104.4	104.0
1949	99.2	102.0
1950	103.1	109.5
1951	114.8	119.6
1952	111.6	118.2
1953	110.1	119.9
1954	110.3	120.2
1955	110.7	125.5
1956	114.3	130.6
1957	117.6	130.6
1958	119.2	130.5
1959	119.5	134.6
1960	119.6	132.6

<sup>a</sup>Taken and calculated from: U. S. Department of Labor, Bureau of Labor Statistics, Wholesale Prices and Price Indexes, Bulletin Nos. 1257 and 1295 (Washington: U. S. Government Printing Office, 1958 and 1959), pp. 28-32; and, U. S. Bureau of the Census, Statistical Abstract of the United States: 1961 (82nd edition; Washington, 1961), p. 751.



TABLE II-4.-Producers' private domestic fixed investment (in millions) in current and constant dollars  
(1947-49=100) 1946 to 1960<sup>a</sup>

Year (1)	New const. excl. res. non-farm (2)	Producers' durable equip. (3)	Total, sum (col 2+3) (4)	Index of total (47-49=100) (5)	Capital consump. allow. (6)	Net pvt. domestic fixed inv.	
						Net inv. (col 4-6) (7)	% change from 1950 (8)
						Current dollars	
1946	6,276	10,733	17,009	64.6	11,666	5,343	
1947	7,719	16,667	24,386	92.5	13,030	11,356	
1948	9,332	18,925	28,257	107.2	15,471	12,786	
1949	9,171	17,236	26,407	100.2	17,274	9,133	
1950	10,115	18,940	29,055	110.3	19,065	9,990	
1951	12,282	21,290	33,572	127.4	21,970	11,602	16.1
1952	12,690	21,264	33,954	128.9	24,007	9,947	-0.4
1953	13,811	22,305	36,116	137.1	26,526	9,590	-4.0
1954	14,343	20,789	35,132	133.3	28,809	6,323	-36.6
1955	16,236	23,119	39,355	149.4	31,986	7,369	-26.3
1956	17,835	27,194	45,029	170.9	34,412	10,617	6.3
1957	19,046	28,497	47,543	180.4	37,443	10,100	1.1
1958	17,436	23,109	40,545	153.9	38,605	1,940	-80.6
1959	17,901	25,936	43,837	166.4	40,962	2,875	-71.2
1960	19,656	27,587	47,243	179.3	43,250	3,993	-60.0

Constant dollars<sup>b</sup>

1946	9,056	13,638	22,694	86.2	14,823	7,371	2.3
1947	8,212	17,289	25,501	96.9	13,517	11,984	1.7
1948	8,973	18,127	27,100	103.0	14,817	12,281	1.4
1949	8,991	17,375	26,366	100.2	17,413	8,953	1.9
1950	9,237	18,371	27,608	104.9	18,492	9,116	1.1
1951	10,269	18,545	28,814	109.5	19,138	9,676	6.1
1952	10,736	19,054	29,790	113.2	21,512	8,278	-9.2
1953	11,519	20,259	31,778	120.7	24,093	7,685	-15.7
1954	11,933	18,848	30,781	116.9	26,119	4,662	-48.9
1955	12,937	20,884	33,821	128.5	28,894	4,927	-46.0
1956	13,656	23,792	37,448	142.3	30,107	7,341	-19.4
1957	14,583	24,232	38,815	147.5	31,839	6,976	-23.5
1958	13,361	19,387	32,748	124.4	32,387	361	-96.1
1959	13,299	21,704	35,003	133.0	34,278	725	-93.1
1960	14,824	23,066	37,890	143.9	36,162	1,728	-31.1

<sup>a</sup>Taken and calculated from: U. S. Department of Commerce, Office of Business Economics, Survey of Current Business, National Income Number, Vol. 42, No. 7 (Washington: July, 1962), p. 6; and, U. S. Department of Commerce, Office of Business Economics, National Income: 1954 Edition (Washington: 1954), pp. 163, 164.

<sup>b</sup>This portion of the table was computed by deflating col. 2 by the construction materials index of Table II-12 while cols 3 and 6 were deflated by the all commodities index of Table II-12.

### Health Insurance

The number of Americans purchasing health insurance protection more than doubled from 1946 to 1960. The extent of protection may have varied widely, but over 74 per cent of the population was insured to some extent in 1960 in contrast to about 30 per cent in 1946. The growth in percentage of population having health insurance is shown in Table II-15.

TABLE II-15.-Voluntary health insurance coverage in the United States,  
1946 to 1960<sup>a</sup>

Year	Percentage of civilian population having health insurance
1946	30.3
1947	36.7
1948	41.8
1949	44.6
1950	50.8
1951	56.3
1952	59.1
1953	62.1
1954	63.6
1955	66.1
1956	69.8
1957	71.8
1958	71.4
1959	73.0
1960	74.1

<sup>a</sup>Source: Commission on the Cost of Medical Care, The Report of the Commission on the Cost of Medical Care Vol. 1: General Report (4 vols.; American Medical Association, 1964, n.p.)



### Summary

Among the more notable changes in the economy during the years included in this study were the following.

Total population increased substantially with the largest gains being registered by the youngest and oldest categories. There were only minor changes in the per cent distribution of population classified by sex or race. The long term trend in increased urbanization continued. While the birth rate initially increased then subsequently declined during the period, both the death rate and marriage rate dropped sharply. Births attended by physicians in hospitals increased while the number of physicians per 100,000 population remained stable. The population density increased at about the same rate as did total population.

The size of the labor force, number employed as well as the number unemployed all increased while the number of people engaged in agricultural employment decreased sharply. Salary and wage income increased greatly although the percentage increase in productivity was only about one-half as great.

Prices as measured by both the consumers' price index and wholesale price index were up sizeably.

Capital accumulation was somewhat cyclical with substantial additions to net investment in the economy being made during the early years of the period of study. A marked decline in investment occurred about mid-way of the period.



## CHAPTER III

### Capacity and Utilization of Short-term General and Other Special Hospitals: 1946-1960

Enactment of the Hospital Survey and Construction Act in 1946 promoted widespread interest in the construction of new hospital facilities. Subsequently, many entirely new hospitals were constructed while many existing hospitals were modernized and expanded.

The result of this construction activity is apparent not only in the total number of hospitals and beds available, but also in the personnel ratios, expense ratios, total assets and utilization of the facilities. In this chapter, information showing changes in capacity and utilization is presented while the changes in personnel and expense ratios and total assets are deferred to chapter four.

#### Capacity and Utilization

Capacity for hospital care is affected not only by the number of hospitals available, but also by their bed complement and the length of treatment cycle. Attention is directed in this section, therefore, to changes in number of hospitals, beds and admissions as well as to changes in occupancy percentage, average daily census and average length of stay.

## Hospitals

As one may have expected, a sizeable increase in hospital facilities accompanied the increase in population during the years of this study. The actual number of all short-term general and other special hospitals increased nearly as rapidly as the total population. However, one of the striking features of the changes in number of hospitals was the rapid increase in hospitals controlled by state or local governmental units while a substantial decline occurred in the number of hospitals under various kinds of proprietary control.

Table III-1 shows the actual numbers of hospitals in the United States by control as well as per cent distribution and per cent change from 1946.

TABLE III-1.-Number of short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent distribution and per cent change from 1946<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Hospitals				
1946	4,444	2,583	1,076	785
1947	4,475	2,641	1,070	764
1948	4,499	2,682	1,056	761
1949	4,585	2,688	1,104	793
1950	5,031	2,871	1,218	942
1951	5,066	2,922	1,155	989
1952	5,122	2,973	1,109	1,040
1953	5,212	3,010	1,117	1,085
1954	5,212	3,056	1,052	1,104
1955	5,237	3,097	1,020	1,120
1956	5,299	3,165	981	1,153
1957	5,309	3,209	932	1,168

TABLE III-1.-Continued

Year	Total	Voluntary	Proprietary	Governmental
1958	5,290	3,203	896	1,191
1959	5,364	3,259	890	1,215
1960	5,407	3,291	856	1,260
Per cent distribution				
1946		58.1	24.2	17.7
1947		59.0	23.9	17.1
1948		59.6	23.5	16.9
1949		58.6	24.1	17.3
1950		57.1	24.2	18.7
1951		57.7	22.8	19.5
1952		58.0	21.7	20.3
1953		57.8	21.4	20.8
1954		58.6	20.2	21.2
1955		59.1	19.5	21.4
1956		59.7	18.6	21.8
1957		60.4	17.6	22.0
1958		60.5	16.9	22.5
1959		60.8	16.6	22.7
1960		60.9	15.8	23.3
Per cent change from 1946				
1946	0.0	0.0	0.0	0.0
1947	0.7	2.2	-0.6 <sup>b</sup>	-2.7
1948	1.2	3.8	-1.9	-8.1
1949	3.2	4.1	2.6	1.0
1950	13.2	11.1	13.2	20.0
1951	14.0	13.1	7.3	26.0
1952	15.3	15.1	3.1	32.5
1953	17.3	16.5	3.8	38.2
1954	17.3	18.3	-2.2	40.6
1955	17.8	19.9	-5.2	42.7
1956	19.2	22.5	-8.8	46.9
1957	19.5	24.2	-13.4	48.8



TABLE III-1.-Continued

Year	Total	Voluntary	Proprietary	Governmental
1958	19.0	24.0	-16.7	51.7
1959	20.7	26.2	-17.3	54.8
1960	21.7	27.4	-20.4	60.5

<sup>a</sup>Source: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue, Vol. 35, Part 2 (Chicago: August 1, 1961), p. 394. Percentages were calculated.

<sup>b</sup>In this and subsequent tables, percentage increases are shown without a sign. Percentage decreases are preceded by the negative sign.

In 1946 short-term hospitals comprised 72.6 per cent of the nation's 6,125 hospitals. By 1960 the total of all hospitals had increased to 6,876 of which 5,826 or 84.7 per cent were short-term. However, 361 of the short-term hospitals were operated by the Federal Government. The remaining 5,407 hospitals constituted 78.6 per cent of all hospitals doing business in the United States.<sup>1</sup>

Until 1958 no information showing the number of hospitals classified by specialized services, i. e., orthopedic, obstetric or other hospitals, was available. Data showing hospitals by service from 1958 through 1960 are shown in Table III-A of Appendix III.

The American Hospital Association's classification of hospitals into size categories according to number of beds available was made on two

---

<sup>1</sup>American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue, Vol. 35, Part 2 (August 1, 1961), p. 394.



different bases during the period of investigation. The first basis, using four size categories, was used for the years 1946 through 1952. Beginning in 1953 seven categories were used. Only one of the seven was identical with any of the four used previously. Although this change of classification bases is somewhat confusing, one may still derive useful information concerning trends in size.

For all short-term hospitals, not much change occurred in the percentage distribution among the four size categories before 1953. However, the total number of hospitals increased slightly faster than did population. For the entire period, 1946-1960, hospitals did not increase as rapidly as population.

With the increase in number of size categories in 1953, it became apparent that some striking changes were occurring in hospital sizes. These changes may be summarized by stating that the very small hospital was seemingly becoming a vanishing phenomenon while the number of larger hospitals, 200 beds and larger, was increasing rapidly.

These changes are shown in Table III-2. Tables III-3, III-4 and III-5, respectively, show changes in the number of hospitals in the various size categories according to type of control, i. e., voluntary, proprietary and state and local governmental.

TABLE III-2.-Number of short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25-49	50-99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Hospitals												
1946	4444								1961	1054	1026	403
1947	4475								1967	1066	1041	401
1948	4499								1980	1064	1043	412
1949	4585								2091	1053	1043	398
1950	5031								2333	1173	1087	436
1951	5066								2305	1175	1131	455
1952	5122								2302	1190	1157	473
1953	5212	963	1362	1208	944	392	244	99				
1954	5212	952	1356	1194	954	404	255	97				
1955	5237	906	1352	1208	984	423	264	100				
1956	5299	857	1384	1254	966	455	282	111				
1957	5309	822	1388	1265	974	461	289	110				
1958	5290	749	1389	1277	990	462	301	122				
1959	5419	748	1421	1325	1022	464	314	125				
1960	5407	674	1413	1345	1011	494	341	129				
Per cent distribution												
1946									44.1	23.7	23.1	9.1
1947									44.0	23.8	23.3	9.0
1948									44.0	23.6	23.2	9.2
1949									45.6	23.0	22.7	8.7
1950									46.4	23.3	21.6	8.7
1951									45.5	23.2	22.3	9.0
1952									44.9	23.2	22.6	9.2

TABLE III-2.-Continued

Per cent change from 1946 and from 1953											
1953	18.5	26.1	23.2	18.1	7.5	4.7	1.9				
1954	18.3	26.0	22.9	18.3	7.8	4.9	1.9				
1955	17.3	25.8	23.1	18.8	8.1	5.0	1.9				
1956	16.2	26.1	23.7	18.2	8.6	5.3	2.1				
1957	15.5	26.1	23.8	18.3	8.7	5.4	2.1				
1958	14.2	26.3	24.1	18.7	8.7	5.7	2.3				
1959	13.8	26.2	24.4	18.9	8.6	5.8	2.3				
1960	12.5	26.1	24.9	18.7	9.1	6.3	2.4				
1946	0.0							0.0	0.0	0.0	0.0
1947	0.7							0.3	1.1	1.5	-0.5
1948	1.2							1.0	0.9	1.7	2.2
1949	3.2							6.6	-0.1	1.7	-1.2
1950	13.2							19.0	11.3	6.1	8.2
1951	14.0							17.5	11.5	10.2	12.9
1952	15.3							17.4	12.9	12.8	17.4
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
1954	0.0	-0.4	-1.2	1.1	3.1	4.5	-2.0				
1955	0.5	-0.7	0.0	4.2	7.9	8.2	1.0				
1956	1.7	-11.0	1.6	2.3	16.1	15.6	12.1				
1957	1.9	-14.6	1.9	3.2	17.6	18.4	11.1				
1958	1.5	-22.2	2.0	4.9	17.9	23.4	23.2				
1959	4.0	-22.3	4.3	8.3	18.4	28.7	26.3				
1960	3.7	-30.0	3.7	7.1	26.0	39.8	30.3				

aTaken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).



TABLE III-3.-Number of voluntary short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25-49	50-99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Hospitals												
1946	2583								790	687	824	282
1947	2641								805	711	842	283
1948	2682								819	707	856	300
1949	2688								844	695	861	288
1950	2871								907	766	889	309
1951	2922								894	780	915	333
1952	2973								908	776	939	350
1953	3010	296	607	781	740	337	203	46				
1954	3056	303	627	761	762	343	214	46				
1955	3097	306	619	777	764	360	223	48				
1956	3165	288	639	820	751	374	240	53				
1957	3209	284	662	825	749	386	248	55				
1958	3203	258	657	822	754	390	259	63				
1959	3259	249	673	832	782	389	271	63				
1960	3291	240	660	848	761	417	295	70				
Per cent distribution												
1946									30.6	26.6	31.9	10.9
1947									30.5	26.9	31.9	10.7
1948									30.5	26.4	31.9	11.2
1949									31.4	25.9	32.0	10.7
1950									31.6	26.7	31.0	10.8
1951									30.6	26.7	31.3	11.4
1952									30.5	26.1	31.6	11.8



TABLE III-3.-Continued

1953	9.8	20.2	25.9	24.6	11.2	6.7	1.5
1954	9.9	20.5	24.9	24.9	11.2	7.0	1.5
1955	9.9	20.0	25.1	24.7	11.6	7.2	1.5
1956	9.1	20.2	25.9	23.7	11.8	7.6	1.7
1957	8.9	20.6	25.7	23.3	12.0	7.7	1.7
1958	8.1	20.5	25.7	23.5	12.2	8.1	2.0
1959	7.6	20.7	25.5	24.0	11.9	8.3	1.9
1960	7.3	20.1	25.8	23.1	12.7	9.0	2.1
Per cent change from 1946 and from 1953							
1946	0.0				0.0	0.0	0.0
1947	2.2				1.9	3.5	2.2
1948	3.8				3.7	2.9	3.9
1949	4.1				6.8	1.2	4.5
1950	11.1				14.8	11.5	7.9
1951	13.1				13.2	13.5	11.0
1952	15.1				14.9	13.0	14.0
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1954	1.5	2.4	-2.6	3.0	1.8	5.4	0.0
1955	2.9	3.4	-0.5	3.2	6.8	9.9	4.3
1956	5.1	-2.7	5.0	1.5	11.0	18.2	15.2
1957	6.6	-4.1	5.6	1.2	14.5	22.2	19.6
1958	6.4	-12.8	5.2	1.9	15.7	27.6	37.0
1959	8.3	-15.9	6.5	5.7	15.4	33.5	37.0
1960	9.3	-18.9	8.6	2.8	23.7	45.3	52.2

<sup>a</sup> Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

TABLE III-4.-Number of proprietary short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	Hospitals								500 & over	Under 50 bds	50- 99	100- 249	250 & over
			25-49	50-99	100- 199	200- 299	300- 499								
1946	1076									853	161	57	5		
1947	1070									863	149	55	3		
1948	1056									857	150	48	1		
1949	1104									910	149	44	1		
1950	1218									999	167	49	3		
1951	1155									953	150	49	3		
1952	1109									912	146	47	4		
1953	1117	512	406	149	50 <sup>b</sup>										
1954	1052	493	371	140	48 <sup>b</sup>										
1955	1020	455	374	137	54 <sup>b</sup>										
1956	981	417	373	134	57 <sup>b</sup>										
1957	932	378	351	142	53	7	0	1							
1958	896	341	350	145	52	7	0	1							
1959	890	336	342	152	52	6	1	1							
1960	856	291	336	161	59	7	1	1							
Per cent distribution															
1946									79.3		15.0	5.3	0.5		
1947									80.7		13.9	5.1	0.3		
1948									81.2		14.2	4.5	0.1		
1949									82.4		13.5	4.0	0.1		
1950									82.0		13.7	4.0	0.2		
1951									82.5		13.0	4.2	0.3		
1952									82.2		13.2	4.2	0.4		











Beginning in 1953, data showing the number of accredited<sup>1</sup> hospitals were available. Other characteristics of accredited hospitals such as beds, admissions, et cetera cannot be determined from extant information. However, it may be assumed that essentially the same per cent distribution relationship as is found among the accredited and non-accredited hospitals in the various size categories also would be found among the other characteristics.

While this assumption is probably erroneous, the size of error could be expected to have a high probability of being immaterial. Such an inference is justified in the four largest size categories inasmuch as 89.5 per cent or more of the hospitals are accredited -- 98.0 or more being accredited in the three largest. In these categories there is no margin for a very large error. Likewise, the same reasoning would seem to hold for the smallest category. Here, 99.7 per cent of the hospitals are not accredited. The number accredited are so few that for all effects on this study they could be disregarded.

In the two remaining size classifications, accredited hospitals constitute approximately 40 per cent of the total number. However, these two groups account for approximately 25 per cent or less of total

---

<sup>1</sup>Hospital accreditation is the responsibility of the Joint Commission on Accreditation of Hospitals which is comprised of 18 members -- six appointed by the American Medical Association, six appointed by the American Hospital Association, and three each appointed by the American College of Physicians and the American College of Surgeons. For further information see "Joint Committee for Accreditation of Hospitals," The Journal of the American Medical Association, Vol. 147, No. 8 (October 20, 1951), p. 761.

beds, admissions, et cetera in all short-term hospitals. Therefore, even if the characteristics are distributed differently than the hospitals as between accredited and non-accredited, the net erroneous percentage effect in the aggregate would only be one-fourth, or somewhat less, the absolute size of the percentage error. This net error could be increased or reduced by some small amount depending upon whether there were either similar or offsetting errors in other size groups.

In view of the foregoing considerations, it appears that the percentage of accredited hospitals may be used as a measure of the other characteristics of hospitals classified into accredited versus non-accredited groups.

For all short-term hospitals, the increase in per cent accredited approximated 10.0 per cent, from 44.7 to 54.6, for the eight years from 1953 through 1960. However, the actual number of accredited hospitals increased 26.8 per cent. This larger percentage increase in actual number of accredited hospitals as opposed to the increase in accredited hospitals as a per cent of all hospitals is explained by the increasing proportion of all hospitals being accredited and by the increase in number of hospitals. The changes for all accredited hospitals classified by size may be observed in Table III-6.

The increase in the percentage of accredited hospitals in each control category was voluntary 7.5, proprietary 9.3 and governmental 9.5. Thus, by 1960, 69.2 per cent of all voluntary hospitals were accredited, while



among proprietary and governmental hospitals respectively, there were 18.0 and 41.6 per cent accredited.

For all control categories there was a progressive increase in the proportion of accredited hospitals as one moved in his observation from the smallest to the largest size groupings.

For all three types of control the proportion accredited in the "Under 25 beds" size was practically nil. The reason for this situation is that hospitals with less than 25 beds are not eligible for accreditation.<sup>1</sup> The fact that any hospitals having less than 25 beds are accredited is probably explained by a change in capacity after accreditation is received. Such change would reduce the capacity below 25 beds.

Nearly all of the large hospitals, 200 beds or larger, were accredited throughout the entire period. However, in the smaller hospitals, accreditation seemed to be somewhat more important to the voluntary hospitals than to either proprietary or governmental hospitals. This inference is drawn from the fact that by 1960 in the "25 to 49", "50 to 99" and "100 to 199" size categories<sup>2</sup> there were respectively 27.9, 69.3 and 95.3 per cent of the voluntary hospitals accredited. The

---

<sup>1</sup>See Accredited Hospitals-December 31, 1960 (Chicago: Joint Committee on Accreditation of Hospitals), p. 1.

<sup>2</sup>Henceforth in this study, size categories will be designated as 25-49, 200-299, et cetera. Quotation marks will be omitted as will the word "beds" following the size specification.



corresponding percentages for proprietary hospitals were 12.2, 39.8 and 69.5 while for governmental hospitals the percentages were 17.3, 44.0 and 72.8.

Data showing (1) number and percentage of all short-term hospitals accredited by size, and (2) number and percentage of accredited short-term hospitals by control and size, are presented in Tables III-6, III-7, III-8 and III-9.

### Beds

Total beds in all non-federal short-term general hospitals were increased approximately 166,000 from 1946 through 1960. This represents an increase of 35.1 per cent. Beds in voluntary hospitals were increased 145,000, rounded to the nearest thousand, which is an increase of 48.1 per cent. State and local hospitals increased their bed complement by about 23,000 while proprietary hospitals' bed capacity decreased almost 2,000. These figures represent an increase in the number of beds in governmental hospitals in the amount of 17.3 per cent and a percentage decrease of 4.9 for beds in proprietary hospitals.

Voluntary hospitals contained 63.6 per cent of all beds in short-term hospitals in 1946 while proprietary hospitals had 8.2 per cent and governmental hospitals 28.2 per cent. By 1960 these percentages had changed to the extent that 69.8 per cent of all short-term beds were found in voluntary hospitals and only 5.8 per cent and 24.4 per cent were available in proprietary and governmental hospitals respectively.

TABLE III-6.-Total number of accredited short-term general and other special hospitals in the United States, 1946-1960, classified by size, with percentage accredited in each size category<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over
Accredited hospitals								
1953	2330	5	188	634	799	368	238	98
1954	2433	3	223	651	826	387	248	95
1955	2526	2	231	666	856	411	260	100
1956	2635	2	249	705	862	430	276	111
1957	2725	3	264	738	875	449	287	109
1958	2765	4	278	738	875	449	300	121
1959	2866	3	294	775	915	448	312	119
1960	2954	2	297	800	905	484	337	129
Percentage accredited								
1953	44.7	0.5	13.8	52.5	84.6	93.9	97.5	99.0
1954	46.7	0.3	16.4	54.5	86.6	95.8	97.3	97.9
1955	48.2	0.2	17.1	55.1	87.0	96.9	98.5	100.0
1956	49.7	0.2	18.0	56.2	89.3	96.6	97.9	100.0
1957	51.3	0.4	19.0	58.3	89.8	97.4	99.3	99.1
1958	52.3	0.5	20.0	57.8	88.4	97.2	99.7	99.2
1959	53.4	0.4	20.9	59.5	90.0	97.2	99.4	100.0
1960	54.6	0.3	21.0	59.5	89.5	98.0	98.8	100.0

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1954-1961).

TABLE III-7.-Number of accredited voluntary short-term general and other special hospitals in the United States, 1946-1960, classified by size, with percentage accredited in each size category<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over
Accredited hospitals								
1953	1856	1	119	496	670	325	200	45
1954	1932	1	146	499	697	334	210	45
1955	1998	1	152	506	712	357	222	48
1956	2069	1	159	535	715	368	238	53
1957	2125	3	173	553	712	383	246	55
1958	2151	4	178	544	717	386	259	63
1959	2226	2	189	569	747	385	271	63
1960	2276	2	184	588	725	415	292	70
Percentage accredited								
1953	61.7	0.3	19.6	63.5	90.5	96.4	98.5	97.8
1954	63.2	0.3	23.3	65.6	91.5	97.4	98.1	97.8
1955	65.4	0.3	24.6	65.1	93.2	98.9	99.6	100.0
1956	65.4	0.3	24.9	65.2	95.3	98.4	99.2	100.0
1957	66.2	1.1	26.1	67.0	95.1	99.2	99.2	100.0
1958	67.2	1.6	27.1	66.2	95.1	99.0	100.0	100.0
1959	68.3	0.8	28.1	68.4	95.5	99.0	100.0	100.0
1960	69.2	0.8	27.9	69.3	95.3	99.5	99.0	100.0

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1954-1961).



TABLE III-8.-Number of accredited proprietary short-term general and other special hospitals in the United States, 1946-1960, classified by size, with percentage accredited in each size category<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over
Accredited hospitals								
1953	126	3	42	48	28	3	1	1
1954	126	2	45	50	25	3	0	1
1955	123	1	39	49	29	4	0	1
1956	132	1	42	54	29	5	0	1
1957	142	0	41	61	34	5	0	1
1958	138	0	39	61	32	5	0	1
1959	147	0	38	68	35	4	1	1
1960	154	0	41	64	41	6	1	1
Percentage accredited								
1953	11.3	0.6	10.3	32.2	65.1	60.0	100.0	100.0
1954	12.0	0.4	12.1	35.7	59.5	60.0	0	100.0
1955	12.1	0.2	10.4	35.8	63.0	57.1	0	100.0
1956	13.5	0.2	11.3	40.3	60.4	62.5	0	100.0
1957	15.2	0	11.7	43.0	64.2	71.4	0	100.0
1958	15.4	0	11.1	42.1	61.5	71.4	0	100.0
1959	16.5	0	11.1	44.7	67.3	66.7	100.0	100.0
1960	18.0	0	12.2	39.8	69.5	85.7	100.0	100.0

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1954-1961).



TABLE III-9.-Number of accredited state and local governmental short-term general and other special hospitals in the United States, 1946-1960, classified by size, with percentage accredited in each size category<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over
Accredited hospitals								
1953	348	1	27	90	101	40	37	52
1954	375	0	32	102	104	50	38	49
1955	405	0	40	111	115	50	38	51
1956	434	0	48	116	118	57	38	57
1957	458	0	50	124	129	61	41	53
1958	476	0	61	133	126	58	41	57
1959	493	1	67	138	133	59	40	55
1960	524	0	72	148	139	63	44	58
Percentage accredited								
1953	32.1	0.6	7.7	32.4	62.7	80.0	92.5	100.0
1954	34.0	0	8.9	34.8	69.3	89.3	92.7	98.0
1955	36.2	0	11.1	37.8	66.1	89.3	92.7	100.0
1956	37.6	0	12.9	38.7	70.7	90.5	90.5	100.0
1957	39.2	0	13.3	41.6	75.0	89.7	100.0	98.1
1958	40.0	0	16.0	42.9	68.5	89.2	97.6	98.3
1959	40.6	0.6	17.1	43.3	72.7	89.4	95.2	100.0
1960	41.6	0	17.3	44.0	72.8	90.0	97.8	100.0

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1954-1961).

A comparison of the changes in number of hospitals with the changes in number of beds reveals some pertinent facts.

First, the number of all short-term non-federal hospitals increased 21.7 per cent from 1946 to 1960 but the number of beds in these hospitals increased 35.1 per cent. This means that there was a disproportionate growth of hospitals among the various size categories. The greatest growth occurred in the larger sizes. This was especially true of voluntary hospitals which increased in number an amount representing 27.4 per cent but the bed capacity of which increased 48.1 per cent.

Second, although the number of proprietary hospitals declined by 20.4 per cent the number of beds decreased only 4.9 per cent. The loss of hospitals in this control group was concentrated to a great extent in the smaller sizes.

Finally, there seems to have been some reversal among governmental hospitals of the growth patterns exhibited by voluntary and proprietary hospitals. The number of governmental hospitals increased 60.5 per cent but their bed capacity increased only 17.3 per cent.

These observations are apparent when one compares percentage increases of hospitals and beds in the various size categories for each type of control. Table III-10 shows the summary of total beds classified into control categories. Tables III-11 through III-14 show the changes in beds for the control categories further classified by size. Appendix III, Table III-B shows beds classified by service.

It was mentioned in the previous section dealing with hospitals that population increased somewhat more than did hospitals during the period of this study. The rate of increase for population was 28.5 per cent while that for hospitals was 21.7 per cent. It thus appeared that by 1960 there may have been a shortage of facilities to provide adequate care for the population. This is assuming that there was little, if any, excess capacity in 1946. However, bed capacity increased during the period by 35.1 per cent. Therefore, one may infer that, to the extent bed capacity represents total capacity, there was either an over capacity by 1960 or less of a shortage in capacity than there had been in 1946, if there were a shortage in 1946.

The assumption is implicit in the foregoing paragraph that the change in utilization of hospitals was roughly comparable with change in population size. Whether this is true is partially examined in the next section of this chapter.

### Admissions

Admissions to all short-term hospitals increased spectacularly during the years of this study. The total percentage increase was 68.2 per cent. Both voluntary and governmental hospitals had large increases -- 75.7 per cent and 71.9 per cent respectively. However, there was only a 10.1 per cent increase in admissions to proprietary hospitals.

Inasmuch as the increases in population, number of hospitals, and number of hospital beds varied between 20 and 35 per cent, it may be concluded that changes in utilization of hospital facilities were not



TABLE III-10.-Number of beds in short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent distribution and per cent change from 1946<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Beds				
1946	473,059	300,943	38,940	133,176
1947	465,000	307,000	38,000	120,000
1948	471,555	315,439	36,543	119,573
1949	477,000	318,000	38,000	121,000
1950	504,504	331,862	41,591	131,051
1951	516,020	344,775	39,216	132,029
1952	530,669	357,365	38,423	134,881
1953	545,903	369,445	38,601	137,857
1954	553,068	377,863	36,444	138,761
1955	567,612	389,059	36,770	141,783
1956	586,000	405,000	37,000	145,000
1957	595,000	412,000	36,000	146,000
1958	610,000	424,000	36,000	150,000
1959	619,877	432,920	36,210	150,747
1960	639,057	445,753	37,029	156,275
Per cent distribution				
1946		63.6	8.2	28.2
1947		66.0	8.2	25.8
1948		66.9	7.7	25.4
1949		66.7	8.0	25.4
1950		65.8	8.2	26.0
1951		66.8	7.6	25.6
1952		67.3	7.2	25.4
1953		67.7	7.1	25.3
1954		68.3	6.6	25.1
1955		68.5	6.5	25.0
1956		69.1	6.3	24.7
1957		69.2	6.1	24.5
1958		69.5	5.9	24.6
1959		69.8	5.8	24.3
1960		69.8	5.8	24.4



TABLE III-10.-Continued

Year	Total	Voluntary	Proprietary	Governmental
Per cent change from 1946				
1946	0.0	0.0	0.0	0.0
1947	-1.7	2.0	-2.4	-9.9
1948	-0.3	4.8	-6.2	-10.2
1949	0.8	5.7	-2.4	-9.1
1950	6.6	10.3	6.8	-1.6
1951	9.1	14.6	0.7	-0.9
1952	12.2	18.7	-1.3	1.3
1953	15.4	22.8	-0.9	3.5
1954	16.9	25.6	-6.4	4.2
1955	20.0	29.3	-5.6	6.5
1956	23.9	34.6	-5.0	8.9
1957	25.8	36.9	-7.6	9.6
1958	28.9	40.9	-7.6	12.6
1959	31.0	43.9	-7.0	13.2
1960	35.1	48.1	-4.9	17.3

<sup>a</sup>Source: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue, Vol. 35, Part 2 (Chicago: August 1, 1961), p. 394. Percentages were calculated.

TABLE III-11.-Number of beds (in thousands) in all short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953a

Year	Total	Beds										500 & over	Under 50 bds	50-99	100-249	250 & over
		Under 25 bds	25-49	50-99	100-199	200-299	300-499	500 & over	Under 50 bds	50-99	100-249					
1946	473								52	72	155					194
1947	465								53	72	159					181
1948	472								53	72	160					186
1949	477								55	75	161					186
1950	505								60	78	167					201
1951	516								62	80	173					202
1952	531								62	81	178					209
1953	546	16	47	82	130	94	89	88								
1954	553	16	47	81	132	97	94	87								
1955	568	15	47	82	136	101	98	89								
1956	586	15	48	85	134	107	104	94								
1957	595	14	49	86	135	111	106	95								
1958	610	13	49	87	137	111	111	102								
1959	633	13	50	90	142	112	116	111								
1960	639	12	49	91	139	117	125	107								
Per cent distribution																
1946									11.0	15.1	32.8					41.0
1947									11.4	15.6	34.2					38.9
1948									11.3	15.3	33.9					39.5
1949									11.5	15.7	33.7					39.1
1950									11.8	15.4	33.0					39.7
1951									12.0	15.5	33.4					39.1
1952									11.7	15.3	33.5					39.4

TABLE III-11.-Continued

Per cent change from 1946 and from 1953											
1953	2.9	8.6	15.0	23.9	17.1	16.3	16.1				
1954	2.9	8.5	14.7	23.8	17.5	17.0	15.7				
1955	2.7	8.3	14.4	23.9	17.9	17.2	15.6				
1956	2.5	8.3	14.5	22.9	18.2	17.7	16.0				
1957	2.4	8.2	14.4	22.7	18.6	17.8	16.0				
1958	2.1	8.0	14.3	22.5	18.2	18.2	16.7				
1959	2.0	7.9	14.2	22.4	17.7	18.3	17.5				
1960	1.8	7.7	14.2	21.7	18.3	19.5	16.8				
Per cent change from 1946 and from 1953											
1946	0.0							0.0	0.0	0.0	0.0
1947	-1.7							1.5	1.1	2.4	-6.8
1948	-0.3							2.3	0.7	2.9	-4.0
1949	0.7							4.9	4.6	3.4	-3.9
1950	6.6							14.4	8.5	7.3	3.3
1951	9.1							18.5	11.7	11.1	3.9
1952	12.2							19.3	13.4	14.6	7.9
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
1954	1.3	-0.4	0.3	-1.0	3.2	5.4	-1.2				
1955	4.0	-4.4	1.1	-0.2	8.4	9.4	0.9				
1956	7.4	-9.0	3.5	3.7	14.2	16.5	6.6				
1957	8.9	-12.6	3.7	4.5	18.4	18.6	8.1				
1958	11.7	-19.2	3.9	6.1	18.7	24.4	9.9				
1959	16.0	-19.7	6.5	9.5	19.4	29.9	26.4				
1960	17.1	-27.6	4.8	10.5	25.1	39.7	22.1				

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).



TABLE III-12.-Number of beds (in thousands) in voluntary short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Beds										500 & over	Under 50 bds	50-99	100-249	250 & over
		Under 25 bds	25-49	50-99	100-199	200-299	300-499	500 & over	Under 50 bds	50-99	100-249					
1946	301								23	48	126	104				
1947	307								24	49	130	104				
1948	315								24	49	133	110				
1949	318								25	49	134	110				
1950	332								25	52	139	116				
1951	345								27	54	142	122				
1952	357								27	54	147	130				
1953	369	5	21	54	104	80	73	32								
1954	378	6	22	52	107	82	78	32								
1955	389	6	22	54	107	86	81	33								
1956	405	5	23	57	106	90	88	37								
1957	412	5	23	57	105	93	90	39								
1958	424	5	23	57	106	94	95	44								
1959	433	na	na	na	na	na	na	na								
1960	446	4	23	58	106	99	107	48								
Per cent distribution																
1946									7.8	15.8	41.9	34.5				
1947									7.9	16.0	42.4	33.7				
1948									7.7	15.4	42.1	34.8				
1949									7.9	15.3	42.0	34.7				
1950									7.5	15.6	41.9	35.0				
1951									7.7	15.7	41.2	35.4				
1952									7.6	15.1	41.1	36.3				





TABLE III-13.-Number of beds (in thousands) in proprietary short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Beds							Under 50 bds	50- 99	100- 249	250 & over
		Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over				
1946	39								19	10	8	1
1947	38								20	9	8	1
1948	37								20	10	6	c
1949	38								21	10	6	c
1950	42								22	11	7	1
1951	39								22	10	7	1
1952	38								21	9	7	1
1953	39	8	13	10	8 <sup>b</sup>							
1954	36	8	12	9	7 <sup>b</sup>							
1955	37	7	13	9	8 <sup>b</sup>							
1956	37	7	13	9	9 <sup>b</sup>							
1957	36	6	12	9	7	2	0	1				
1958	36	na	na	na	na	na	na	na				
1959	36	na	na	na	na	na	na	na				
1960	37	5	11	11	8	2	c	1				
Per cent distribution												
1946									50.0	26.4	20.0	3.6
1947									53.1	24.6	19.9	2.3
1948									55.2	26.3	17.7	0.8
1949									54.5	27.7	16.9	0.8
1950									53.8	25.8	17.6	2.8
1951									55.8	24.6	16.9	2.7
1952									54.9	24.4	17.0	3.7





TABLE III-14.-Number of beds (in thousands) in state and local governmental short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953a

Year	Total	Beds											500 & over	Under 50 bds	50- 99	100- 249	250 & over	
		Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over										
1946	133													9	14	22	89	
1947	120													9	14	21	76	
1948	120													9	14	21	76	
1949	121													9	16	21	76	
1950	131													12	15	20	83	
1951	132													13	16	24	78	
1952	135													14	18	25	78	
1953	138	3	12	18	105b													
1954	139	3	12	20	104b													
1955	142	3	12	19	107b													
1956	145	3	13	20	109b													
1957	146	3	13	20	22	16	16	56										
1958	150	na	na	na	na	na	na	na										
1959	151	na	na	na	na	na	na	na										
1960	156	3	14	22	25	17	17	59										
Per cent distribution																		
1946														6.9	10.3	16.2	66.6	
1947														7.2	11.6	17.6	63.6	
1948														7.4	11.6	17.2	63.8	
1949														7.4	13.1	17.0	62.5	
1950														9.4	11.5	15.5	63.5	
1951														10.1	12.3	18.2	59.4	
1952														10.4	13.3	18.2	58.1	



**TABLE III-14. -Continued**

[illegible]

aTaken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961)

<sup>b</sup>Refers to the size class 100 and over.

comparable with changes in population and facilities available. On the contrary, there was a larger increase in utilization at least to the extent that number of admissions measures utilization.

Not a great amount of change was apparent in the percentage distribution of admissions among the three hospital control categories. Slight increases were registered by voluntary and governmental hospitals at the expense of a fairly large decrease by proprietary hospitals. These changes may be observed in Table III-15.

That there was an increase in utilization may be observed in a slightly different manner. There were approximately 17 million admissions in all short-term hospitals in 1950. This means that about one person out of every nine in the United States was hospitalized in that year. By 1960 there were almost 23 million admissions, or one of every eight persons in the population was hospitalized.

Admissions classified by service categories are shown in Table III-C, Appendix III.

When admissions are categorized according to the size of hospital in which they occurred, an already familiar pattern reappears. There was a percentage decrease in the number of admissions to hospitals having capacity of less than 25 beds, moderate increases occurred in admissions to hospitals having between 25 and 199 beds while large increases were recorded by hospitals having 200 or more beds. In 1946, 32 per cent of all admissions were to hospitals having fewer than 100 beds. By 1960 this percentage had dropped to 25.3 per cent.

This same pattern was generally manifested by the hospitals of each control group. Admissions to governmental and voluntary hospitals decreased less than admissions to proprietary hospitals in the smallest size category. Admissions to proprietary hospitals in the 25-49 beds size also decreased while both governmental and voluntary hospitals had increases in this size category. All control groups showed increases in all other size categories with the largest increases being shown in the largest sizes.

The net result of these changes was that while in 1946 admissions to voluntary, proprietary and governmental hospitals of less than 100 beds were respectively 26.7 per cent, 77.5 per cent and 27.3 per cent of all admissions to these hospitals, by 1960 these percentages had changed to 19.3, 72.6 and 31.9. The increase in admissions to governmental hospitals of fewer than 100 beds is largely explained by the increase in admissions to hospitals having between 50 and 99 beds although there was an increase in the sum of admissions to the two smaller size categories.

These changes are shown in Tables III-16 through III-19.



TABLE III-15.-Number of admissions (in thousands) to short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent distribution and per cent change from 1946<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Admissions				
1946	13,655	9,554	1,408	2,694
1947	15,908	10,935	1,604	3,370
1948	15,072	10,587	1,479	3,007
1949	15,428	11,070	1,489	2,868
1950	16,663	11,629	1,661	3,374
1951	16,677	11,946	1,545	3,186
1952	17,413	12,509	1,575	3,329
1953	18,098	12,993	1,600	3,504
1954	18,392	13,364	1,465	3,562
1955	19,100	13,875	1,459	3,766
1956	20,107	14,690	1,495	3,922
1957	21,002	15,374	1,524	4,104
1958	21,684	15,825	1,532	4,327
1959	21,605	15,929	1,425	4,252
1960	22,970	16,788	1,550	4,632
Per cent distribution				
1946		70.0	10.3	19.7
1947		68.7	10.1	21.2
1948		70.2	9.8	20.0
1949		71.8	9.7	18.6
1950		69.8	10.0	20.2
1951		71.6	9.3	19.1
1952		71.8	9.0	19.1
1953		71.8	8.8	19.4
1954		72.7	8.0	19.4
1955		72.6	7.6	19.7
1956		73.1	7.4	19.5
1957		73.2	7.3	19.5
1958		73.0	7.1	20.0
1959		73.7	6.6	19.7
1960		73.1	6.7	20.2



TABLE III-15.-Continued

Year	Total	Voluntary	Proprietary	Governmental
Per cent change from 1946				
1946	0.0	0.0	0.0	0.0
1947	16.5	14.5	13.9	25.1
1948	10.4	10.8	5.0	11.6
1949	13.0	15.9	5.8	6.5
1950	22.0	21.7	18.0	25.2
1951	22.1	25.0	9.7	18.3
1952	27.5	30.9	11.9	23.6
1953	32.5	36.0	13.6	30.1
1954	34.7	39.9	4.0	32.2
1955	39.9	45.2	3.6	39.3
1956	47.3	53.8	6.2	45.6
1957	53.8	60.9	8.2	52.3
1958	58.8	65.5	8.8	60.6
1959	58.2	66.7	1.2	57.8
1960	68.2	75.7	10.1	71.9

<sup>a</sup>Source: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue, Vol. 35, Part 2 (Chicago: August 1, 1961), p. 394. Percentages were calculated.

TABLE III-16.-Number of admissions (in thousands) to all short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953a

Year	Total	Admissions										500 & over	100- 249	250 & over
		Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249			
1946	13,655								1,869	2,504	4,750	4,532		
1947	15,908								2,229	2,894	5,761	5,025		
1948	15,072								1,964	2,658	5,632	4,820		
1949	15,428								2,235	2,609	5,640	4,944		
1950	16,663								2,240	2,896	6,125	5,403		
1951	16,677								2,268	2,897	6,128	5,383		
1952	17,413								2,308	3,072	6,380	5,654		
1953	18,098	608	1,732	3,079	4,774	3,222	2,808	1,874						
1954	18,392	592	1,713	2,971	4,801	3,388	3,028	1,898						
1955	19,100	565	1,732	3,001	4,952	3,641	3,217	1,992						
1956	20,107	544	1,771	3,217	5,059	3,852	3,462	2,202						
1957	21,002	530	1,865	3,288	5,261	4,121	3,662	2,276						
1958	21,684	506	1,877	3,379	5,382	4,184	3,835	2,521						
1959	21,645	469	1,804	3,272	5,418	4,174	4,069	2,434						
1960	22,970	438	1,888	3,500	5,448	4,488	4,467	2,742						
Per cent distribution														
1946									13.7	18.3	34.8	33.2		
1947									14.0	18.2	36.2	31.6		
1948									13.0	17.6	37.4	32.0		
1949									14.5	16.9	36.6	32.0		
1950									13.4	17.4	36.8	32.4		
1951									13.6	17.4	36.7	32.3		
1952									13.3	17.6	36.6	32.5		

TABLE III-16. -Continued

[illegible]

<sup>a</sup>taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).



TABLE III-17.-Number of admissions (in thousands) to voluntary short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Admissions										
		Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
1946	9,554								809	1,740	4,005	3,000
1947	10,935								934	1,981	4,754	3,265
1948	10,587								838	1,789	4,668	3,293
1949	11,070								978	1,794	4,825	3,472
1950	11,629								923	1,953	5,223	3,530
1951	11,946								957	1,978	5,150	3,861
1952	12,509								968	2,042	5,347	4,152
1953	12,993	191	769	2,024	3,830	2,843	2,458	878				
1954	13,364	190	792	1,931	3,920	2,974	2,647	911				
1955	13,875	195	797	1,968	3,948	3,185	2,829	954				
1956	14,690	179	807	2,148	4,024	3,358	3,096	1,079				
1957	15,374	178	848	2,177	4,152	3,581	3,261	1,151				
1958	15,825	168	874	2,184	4,210	3,626	3,441	1,322				
1959	15,929	na	na	na	na	na	na	na				
1960	16,788	155	852	2,217	4,210	3,879	3,990	1,484				
Per cent distribution												
1946									8.5	18.2	41.9	31.4
1947									8.5	18.1	43.5	29.9
1948									7.9	16.9	44.1	31.1
1949									8.8	16.2	43.6	31.4
1950									7.9	16.8	44.9	30.4
1951									8.0	16.6	43.1	32.3
1952									7.7	16.3	42.7	33.2



TABLE III-17.—Continued

Per cent change from 1946 and 1953											
1953	1.5	5.9	15.6	29.5	21.9	18.9	6.8				
1954	1.4	5.9	14.4	29.3	22.3	19.8	6.8				
1955	1.4	5.7	14.2	28.5	23.0	20.4	6.9				
1956	1.2	5.5	14.6	27.4	22.9	21.1	7.3				
1957	1.2	5.7	14.2	27.0	23.3	21.2	7.5				
1958	1.1	5.5	13.8	26.6	22.9	21.7	8.4				
1959	na	na	na	na	na	na	na				
1960	1.0	5.1	13.2	25.1	23.1	23.8	8.8				
Per cent change from 1946 and 1953											
1946	0.0							0.0	0.0	0.0	0.0
1947	11.4							15.5	13.8	18.7	8.8
1948	10.1							3.6	2.8	16.6	9.7
1949	11.6							20.9	3.1	20.5	15.7
1950	12.2							14.1	12.3	30.4	17.7
1951	12.5							18.3	13.7	28.6	28.7
1952	13.1							19.7	17.4	33.5	38.4
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
1954	-0.4	3.0	-4.6	2.3	4.6	7.7	3.7				
1955	2.1	3.6	-2.8	3.1	12.0	15.1	8.7				
1956	-5.8	4.9	6.1	5.0	18.1	25.9	22.9				
1957	-6.7	13.7	7.5	8.4	26.0	32.6	31.0				
1958	-12.0	13.6	7.9	9.9	27.5	40.0	50.6				
1959	na	na	na	na	na	na	na				
1960	-18.5	10.7	9.6	9.9	36.5	62.3	69.0				

aTaken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

TABLE III-18.-Number of admissions (in thousands) to proprietary short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Admissions												
1946	1,408								750	340	265	53
1947	1,604								902	367	300	34
1948	1,479								799	408	263	8
1949	1,490								864	364	252	9
1950	1,661								889	458	288	25
1951	1,545								854	388	273	31
1952	1,575								847	397	282	48
1953	1,600	326	539	419	317 <sup>b</sup>							
1954	1,465	311	496	365	293 <sup>b</sup>							
1955	1,459	284	499	352	324 <sup>b</sup>							
1956	1,495	272	498	354	371 <sup>b</sup>							
1957	1,524	251	497	393	305	69	0.0	8				
1958	1,532	na	na	na	na	na	na	na				
1959	1,425	na	na	na	na	na	na	na				
1960	1,550	193	482	450	336	70	12	7				
Per cent distribution												
1946									53.3	24.2	18.9	3.7
1947									56.3	22.9	18.7	2.1
1948									54.0	27.6	17.8	0.6
1949									58.0	24.4	16.9	0.6
1950									53.6	27.6	17.3	1.5
1951									55.3	25.1	17.7	2.0
1952									53.8	25.2	17.9	3.1





TABLE III-19.-Number of admissions (in thousands) to state and local governmental short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Admissions												
1946	2,694								310	424	480	1,479
1947	3,370								392	546	706	1,725
1948	3,007								327	461	701	1,519
1949	2,868								393	450	563	1,462
1950	3,374								434	485	605	1,851
1951	3,186								457	531	705	1,492
1952	3,329								492	732	751	1,453
1953	3,504	96	432	646	2,330 <sup>b</sup>							
1954	3,562	91	425	675	2,371 <sup>b</sup>							
1955	3,766	86	436	682	2,562 <sup>b</sup>							
1956	3,922	93	466	715	2,648 <sup>b</sup>							
1957	4,104	101	493	718	803	471	401	1,117				
1958	4,327	na	na	na	na	na	na	na				
1959	4,252	na	na	na	na	na	na	na				
1960	4,632	90	554	833	901	538	465	1,251				
Per cent distribution												
1946									11.5	15.8	17.8	54.9
1947									11.6	16.2	21.0	51.2
1948									10.9	15.3	23.3	50.5
1949									13.7	15.7	19.6	51.0
1950									12.9	14.4	17.9	54.8
1951									14.4	16.7	22.1	46.8
1952									14.8	19.0	22.6	43.7

TABLE III-19. --Continued

	1953	1954	1955	1956	1957	1958	1959	1960
2.7	12.3	18.4	66.5b					
2.6	11.9	18.9	66.6b					
2.3	11.6	18.1	68.0b					
2.4	11.9	18.2	67.5b					
2.5	12.0	17.5	19.6	11.5	9.8	27.2		
na	na	na	na	na	na	na		
na	na	na	na	na	na	na		
1.9	12.0	18.0	19.5	11.6	10.0	27.0		
Per cent change from 1946 and 1953								
1946	0.0							
1947	12.5							
1948	11.2							
1949	10.6							
1950	12.5							
1951	11.8							
1952	12.4							
1953	0.0							
1954	1.6							
1955	7.4							
1956	11.9							
1957	17.1							
1958	23.5							
1959	21.3							
1960	32.2							

\*Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961)

<sup>b</sup>These figures are for the size category 100 and over.  
naNot available.

### Average Daily Census

As indicated in the preceding section on admissions, the number of admissions is one indicator of the utilization of hospitals. Admissions measure, at least to some extent, the number of people using hospital facilities. However, with both population and hospital bed capacity expanding, it would be expected that the number of admissions should increase. But even though this increase was greater than the increases in population and hospital capacity, the inference that there was an increase in utilization does not necessarily follow. If the average length of stay decreased,<sup>1</sup> there should have been a reduced utilization of capacity unless the increase in admissions was great enough to increase the average daily census and occupancy percentage. Whether this occurred can be determined by an examination of the tables in this and the following section. Thus admissions, average daily census and occupancy percentage examined in combination reveal a more complete picture of utilization changes.

In 1960, the daily average number of patients in all short-term non-federal hospitals was 477,000 in contrast to an average daily census of 341,000 in 1946. This is an increase of 39.9 per cent while total population increased only 26.8 per cent during this same period. It may be inferred either that there was an increase in illness severe enough to require hospitalization or if there were no such increase that there was

---

<sup>1</sup>In a subsequent section of this chapter, it will be shown that a general decrease in length of stay did occur in short-term hospitals.



an increased ability to purchase hospital care and an increased willingness to make such purchases. There also could have been some combination of these two alternatives.

This increase in average daily census of 39.9 per cent when compared with an increase of 21.7 per cent in number of hospitals and 35.1 per cent in bed capacity supports the conclusion that there was an increased utilization of hospital resources.

The usual control pattern again reveals itself -- there was an increase of 47.6 per cent in the average daily census of voluntary hospitals, a decrease of 4.0 per cent for proprietary hospitals, and an increase of 33.3 per cent for governmental hospitals.

The distribution of total census among the various control categories did not change greatly -- voluntary hospitals' proportion increased 3.8 per cent while there was a decrease of 2.4 per cent and 1.2 per cent in the proportions attributable to proprietary and governmental hospitals respectively. The remaining 0.2 per cent is the result of rounding errors.

The data on which the foregoing statements are based are found in Table III-20. Classification by service categories is shown in Table III-D of Appendix III.

The effect of size of hospital on average daily census is shown in Tables III-21 through III-24. In general, the usual pattern prevails -- there is a decrease recorded in the small hospital and rather large increases shown by larger hospitals. Specifically, in the smallest size

category there was a decrease for all hospitals, but the decrease for voluntary hospitals was less than for proprietary, while there was an increase in the census of governmental hospitals. In the largest size class there was an increase of 55.7 per cent shown by voluntary hospitals, but information was not complete enough to show the change in this size class for the other two control groups. However, if the data are regrouped into a 100 and over class for these two categories, then the increases are respectively 27.1 per cent and 9.9 per cent for proprietary and governmental hospitals. These changes are from 1953 to 1960.

TABLE III-20.-Average daily census in short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent distribution and per cent change from 1946<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Average Daily Census				
1946	341,000	231,000	25,000	84,000
1947	354,000	244,000	25,000	85,000
1948	361,000	246,000	24,000	91,000
1949	352,000	241,000	23,000	88,000
1950	372,000	247,000	26,000	99,000
1951	378,000	257,000	24,000	97,000
1952	385,000	263,000	24,000	97,000
1953	394,000	270,000	25,000	99,000
1954	393,000	274,000	22,000	97,000
1955	407,000	285,000	22,000	100,000
1956	425,000	300,000	23,000	101,000
1957	438,000	312,000	23,000	103,000
1958	451,000	321,000	24,000	106,000
1959	462,010	330,598	23,479	107,933
1960	477,437	341,254	24,231	111,952

TABLE III-20.-Continued

Year	Total	Voluntary	Proprietary	Governmental
Per cent distribution				
1946		67.7	7.3	24.6
1947		68.9	7.1	24.0
1948		68.1	6.6	25.2
1949		68.5	6.5	25.0
1950		66.4	7.0	26.6
1951		68.0	6.3	25.7
1952		68.3	6.2	25.2
1953		68.5	6.3	25.1
1954		69.7	5.6	24.7
1955		70.0	5.4	24.6
1956		70.6	5.4	23.8
1957		71.2	5.3	23.5
1958		71.2	5.3	23.5
1959		71.6	5.1	23.4
1960		71.5	5.1	23.4
Per cent change from 1946				
1946	0.0	0.0	0.0	0.0
1947	3.8	5.6	0.0	1.2
1948	5.9	6.5	-4.0	8.3
1949	3.2	4.3	-8.0	4.8
1950	9.1	6.9	4.0	17.9
1951	10.9	11.3	-4.0	15.5
1952	12.9	13.9	-4.0	15.5
1953	15.5	16.9	0.0	17.9
1954	15.2	18.6	-12.0	15.5
1955	19.4	23.4	-12.0	19.0
1956	24.6	29.9	-8.0	20.2
1957	28.4	35.1	-8.0	22.6
1958	32.3	39.0	-4.0	26.2
1959	35.5	43.3	-8.0	28.6
1960	39.9	47.6	-4.0	33.3

<sup>a</sup>Source: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue, Vol. 35, Part 2 (Chicago: August 1, 1961), p. 396. Percentages were calculated.



TABLE III-21.-Average daily census (in thousands) in all short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Average daily census												
1946	341								31	49	119	141
1947	354								33	52	126	142
1948	361								32	51	126	152
1949	352								34	49	124	146
1950	372								33	51	125	163
1951	378								36	52	130	160
1952	385								35	54	132	164
1953	394	8	27	53	94	71	70	71				
1954	393	8	26	51	93	73	73	68				
1955	407	8	26	52	96	77	76	71				
1956	425	8	27	55	98	82	81	75				
1957	438	8	28	57	99	85	85	76				
1958	451	7	29	58	102	87	88	80				
1959	474	7	30	60	105	88	93	90				
1960	477	6	30	60	103	92	101	85				
Per cent distribution												
1946									9.2	14.4	34.9	41.5
1947									9.4	14.7	35.7	40.2
1948									8.9	14.1	34.8	42.2
1949									9.5	13.8	35.3	41.3
1950									8.8	13.7	33.6	43.9
1951									9.4	13.8	34.3	42.5
1952									9.1	13.9	34.2	42.8

TABLE III-21.-Continued

	1953	2.1	6.8	13.6	23.8	18.0	17.7	17.9
	1954	2.1	6.7	13.1	23.7	18.5	18.5	17.4
	1955	1.9	6.5	12.8	23.7	18.9	18.7	17.5
	1956	1.8	6.5	13.0	23.0	19.2	19.0	17.6
	1957	1.7	6.5	12.9	22.7	19.5	19.4	17.3
	1958	1.6	6.5	12.9	22.5	19.2	19.6	17.8
	1959	1.5	6.3	12.7	22.3	18.6	19.7	19.0
	1960	1.4	6.2	12.7	21.6	19.3	21.1	17.8
Per cent change from 1946 and 1953								
1946	0.0							0.0
1947	10.4							6.0
1948	10.6							2.4
1949	10.3							7.2
1950	10.9							4.7
1951	11.1							13.5
1952	11.3							11.5
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1954	-0.2	-2.8	-1.5	-4.1	-0.5	2.3	4.3	-3.1
1955	3.3	-9.3	-1.5	-2.7	2.8	8.4	9.3	1.0
1956	7.8	-9.6	2.9	-3.1	4.0	15.0	15.6	5.7
1957	11.2	-11.3	6.4	-5.7	6.1	20.2	22.0	7.2
1958	14.6	-15.7	9.4	8.7	8.2	21.9	26.6	13.8
1959	20.3	-17.2	12.1	12.3	12.4	23.9	33.9	27.4
1960	21.2	-23.7	10.9	13.0	9.8	29.7	44.5	20.5

a Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

TABLE III-22.-Average daily census (in thousands) in voluntary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution, and per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Average daily census												
1946	231								15	34	99	83
1947	244								16	37	106	85
1948	246								15	36	106	90
1949	241								15	35	105	86
1950	247								14	35	105	93
1951	257								16	36	108	97
1952	263								16	36	109	102
1953	270	3	13	36	75	61	57	26				
1954	274	3	13	34	76	62	60	26				
1955	285	3	13	35	77	66	64	27				
1956	300	3	13	38	78	70	69	30				
1957	312	3	14	38	79	73	73	32				
1958	321	3	14	39	80	74	76	35				
1959	331	na	na	na	na	na	na	na				
1960	341	3	14	40	80	78	87	40				
Per cent distribution												
1946									6.4	14.7	42.9	36.0
1947									6.5	15.1	43.0	36.3
1948									6.2	14.4	43.0	36.3
1949									6.3	14.3	43.6	35.7
1950									5.8	14.0	42.5	37.6
1951									6.2	14.1	41.9	37.8
1952									6.0	13.9	41.5	38.6



TABLE III-22.-Continued

1953	1.1	4.6	13.3	27.8	22.6	21.2	9.4					
1954	1.1	4.7	12.4	27.8	22.6	22.0	9.3					
1955	1.0	4.5	12.3	27.0	23.2	22.5	9.5					
1956	0.9	4.4	12.6	25.9	23.2	23.0	10.0					
1957	0.9	4.5	12.3	25.4	23.3	23.4	10.2					
1958	0.8	4.5	12.1	24.9	23.0	23.7	11.0					
1959	na	na	na	na	na	na	na					
1960	0.7	4.1	11.6	23.4	23.0	25.5	11.6					
Per cent change from 1946												
1946	0.0							0.0	0.0	0.0	0.0	0.0
1947	10.5							6.7	8.8	6.7	2.1	
1948	10.6							2.7	4.8	6.7	7.5	
1949	10.4							2.2	1.7	6.0	3.5	
1950	10.7							-3.2	2.0	5.9	11.7	
1951	11.1							7.0	6.9	8.4	16.5	
1952	11.4							7.0	7.5	9.9	22.2	
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
1954	1.4	3.0	-5.4	1.5	1.3	5.6	0.3					
1955	5.3	1.2	-2.5	2.6	8.2	11.9	5.7					
1956	11.2	5.5	5.0	3.8	13.8	20.7	18.1					
1957	15.4	12.0	6.8	5.6	18.9	27.6	24.6					
1958	18.9	14.3	8.2	6.7	21.0	33.0	38.2					
1959	22.4	na	na	na	na	na	na					
1960	26.3	-13.1	12.7	6.4	28.2	52.6	55.7					

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.

TABLE III-23.-Average daily census (in thousands) in proprietary short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Average daily census												
1946	25								11	7	6	1
1947	25								12	6	6	1
1948	24								12	6	5	c
1949	23								13	6	5	c
1950	26								12	7	6	1
1951	24								12	6	5	1
1952	24								12	6	5	1
1953	25	4	8	7								
1954	22	4	7	6	6b							
1955	22	4	7	6	6b							
1956	23	3	7	6	7b							
1957	23	3	7	6	5	1	0.0	c				
1958	24	na	na	na	na	na	na	na				
1959	23	na	na	na	na	na	na	na				
1960	24	3	7	7	6	1	c	c				
Per cent distribution												
1946									44.0	27.7	23.4	5.0
1947									47.9	25.5	23.3	3.3
1948									49.2	27.1	22.9	0.8
1949									54.6	24.4	20.1	1.0
1950									47.5	27.4	22.1	3.1
1951									49.8	26.1	20.6	3.5
1952									48.4	26.4	21.5	3.7





TABLE III-24.-Average daily census (in thousands) in state and local governmental short-term general and other special hospitals in the United States, 1946-1960, by size with per cent distribution, and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Average daily census												
1946	84								5	8	14	57
1947	85								5	9	14	57
1948	91								5	9	14	62
1949	88								6	8	14	59
1950	99								6	9	14	69
1951	97								8	10	17	63
1952	97								7	11	17	62
1953	99	1	6	11	80 <sup>b</sup>							
1954	97	1	6	11	78 <sup>b</sup>							
1955	100	1	6	11	81 <sup>b</sup>							
1956	101	1	7	12	81 <sup>b</sup>							
1957	103	2	7	12	15	11	12	44				
1958	106	na	na	na	na	na	na	na				
1959	108	na	na	na	na	na	na	na				
1960	112	1	8	14	17	12	13	45				
Per cent distribution												
1946									6.4	9.6	16.2	67.8
1947									6.2	10.3	17.0	66.5
1948									5.7	9.9	15.7	68.7
1949									6.6	9.6	16.4	67.3
1950									6.3	9.3	14.3	70.1
1951									7.8	10.0	17.4	64.8
1952									7.7	11.1	17.8	63.4



### Occupancy Percentage

For all short-term hospitals there was a slight increase in occupancy percentage during the period -- from 72.1 per cent to 74.7 per cent. This statistic relates average daily census to bed capacity. Therefore, the 2.6 per cent increase in the average occupancy indicates that the average number of patients receiving care daily in hospitals increased by an amount somewhat greater than the number of beds added to capacity.

It can be concluded also that there was an improvement in the utilization of the nation's hospital resources. The increased occupancy percentage is an indicator that bed capacity received increased usage while the increase in number of admissions, discussed in a previous section, indicates an increase in the usage of other service facilities such as laboratories, x-ray, et cetera. That the service facilities received increased usage is concluded inasmuch as it is common practice to perform certain routine procedures for all patients admitted, e. g., chest x-ray or complete blood count and urinalysis.

For hospitals classified by control categories there was very little percentage change in the total voluntary and total proprietary figures. But governmental hospitals' occupancy percentage increased from 63.2 per cent of capacity in 1946 to 71.6 per cent in 1960 -- an increase of 8.4 per cent.

These changes are shown in Table III-25. Available data showing occupancy percentage by service are presented in Appendix III, Table III-E.



Classification of occupancy percentages for all hospitals into size group reveals a pattern that is consistently found for each control group when its occupancy percentage is classified by size of hospital. That is, for the entire period the very small hospitals had an average occupancy of slightly above 50 per cent. With increasing hospital size, the percentage increased steadily. The largest hospitals had an occupancy percentage of approximately 80 per cent.

Occupancy percentage classified according to hospital control and size is shown in Tables III-26 through III-29.

TABLE III-25.-Occupancy percentage of short-term general and other special hospitals in the United States, 1946-1960, by control<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
1946	72.1	76.7	64.1	63.2
1947	76.1	79.5	65.8	70.8
1948	76.5	78.1	64.9	75.8
1949	73.8	75.8	60.5	72.7
1950	73.7	74.4	61.9	75.6
1951	73.3	74.5	61.5	73.5
1952	72.5	73.7	63.2	71.9
1953	72.0	73.2	63.9	71.7
1954	70.9	72.2	61.1	69.8
1955	71.5	73.0	59.5	70.4
1956	72.4	74.1	62.2	69.7
1957	73.6	75.7	63.9	70.5
1958	73.9	75.7	66.7	70.7
1959	74.5	76.4	63.9	71.5
1960	74.7	76.6	65.4	71.6

<sup>a</sup>Taken from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue, (Chicago: 1949-1961).

TABLE III-26.-Occupancy percentage of all short-term general and other special hospitals in the United States, 1946-1960, by size<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
1946	72.0								60.1	68.6	76.5	72.9
1947	76.9								62.8	72.1	79.4	80.5
1948	76.5								60.3	70.7	78.6	81.7
1949	75.9								61.4	65.0	77.4	78.1
1950	73.7								55.1	65.5	74.9	81.4
1951	73.3								57.6	65.4	75.4	79.6
1952	72.5								56.2	66.1	73.9	78.6
1953	72.0	52.8	57.0	65.2	71.9	75.9	78.1	80.5				
1954	70.9	51.6	56.0	63.2	70.9	75.2	77.3	79.0				
1955	71.7	50.0	55.6	63.5	71.2	75.9	78.1	80.5				
1956	72.4	52.5	56.7	64.8	72.8	76.4	77.5	79.8				
1957	73.6	53.7	58.5	66.0	73.8	77.0	80.3	79.8				
1958	73.9	55.1	60.1	66.8	74.0	78.0	79.5	78.9				
1959	74.5	54.5	60.0	66.8	74.2	78.7	80.5	81.1				
1960	74.7	55.7	60.4	66.6	74.2	78.7	80.8	79.4				

<sup>a</sup>Taken from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

TABLE III-27.--Occupancy percentage of voluntary short-term general and other special hospitals in the United States, 1946-1960, by size<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
1946	76.9								63.4	71.3	78.8	80.1
1947	79.4								65.6	75.2	81.3	82.2
1948	78.1								62.8	73.2	79.8	81.6
1949	75.9								60.2	71.1	78.7	78.0
1950	74.5								57.8	66.9	75.6	80.1
1951	74.5								59.9	67.1	75.9	79.4
1952	73.7								58.7	67.8	74.5	78.5
1953	73.1	53.9	58.7	66.5	72.2	76.2	78.1	81.0				
1954	72.5	53.1	58.4	64.8	71.3	75.8	77.7	80.8				
1955	73.1	50.5	57.3	65.3	71.9	76.7	78.7	81.3				
1956	74.2	54.4	58.3	66.6	73.4	77.4	78.7	82.1				
1957	75.6	55.4	59.8	67.7	75.1	78.2	81.2	82.1				
1958	75.8	56.0	61.2	68.2	75.2	78.9	80.2	80.8				
1959	76.4	na	na	na	na	na	na	na				
1960	76.6	57.0	61.1	68.0	75.0	79.5	81.1	82.5				

<sup>a</sup>Taken from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.



TABLE III-28.-Occupancy percentage of proprietary short-term general and other special hospitals in the United States, 1946-1960, by size<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
1946	65.1								57.2	68.4	76.1	88.8
1947	67.0								60.5	69.7	77.8	94.1
1948	64.7								57.7	66.8	83.5	60.1
1949	61.2								61.3	53.9	72.5	71.7
1950	61.6								54.4	65.4	77.2	67.4
1951	62.4											
1952	62.3								55.7	66.2	76.0	80.4
1953	63.9	53.6	58.6	68.1	78.3 <sup>b</sup>				54.9	67.4	78.7	62.2
1954	61.6	51.4	56.7	65.1	76.4 <sup>b</sup>							
1955	60.9	50.7	56.1	64.8	73.2 <sup>b</sup>							
1956	62.9	52.5	55.8	64.7	79.1 <sup>b</sup>							
1957	64.3	52.9	58.7	66.4	75.6	82.4	0.0	76.0				
1958	65.4	na	na	na	na	na	na	na				
1959	64.8	na	na	na	na	na	na	na				
1960	65.4	54.8	60.6	65.7	74.6	83.1	84.4	59.6				

<sup>a</sup>Taken from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup>These figures are for the size class 100 and over.

na Not available.

TABLE III-29.-Occupancy percentage of state and local governmental short-term general and other special hospitals in the United States, 1946-1960, by size<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
1946	63.2								58.0	59.0	63.5	64.3
1947	70.2								60.4	62.8	68.1	74.0
1948	76.0								59.1	64.9	69.3	81.8
1949	72.6								65.5	53.3	69.9	78.2
1950	75.6								50.8	60.8	69.4	83.5
1951	73.2								56.1	59.5	70.3	79.9
1952	72.3								53.3	60.2	70.6	79.0
1953	71.8	49.4	52.3	59.8								
1954	69.7	49.0	51.0	57.9	74.7 <sup>b</sup>							
1955	70.5	47.6	52.0	58.1	75.5 <sup>b</sup>							
1956	69.8	49.0	54.9	59.6	74.0 <sup>b</sup>							
1957	70.5	52.3	55.9	61.0	67.4	69.8	75.2	78.2				
1958	70.9	na	na	na	na	na	na	na				
1959	71.6	na	na	na	na	na	na	na				
1960	71.6	55.0	59.0	63.5	70.6	73.4	76.6	77.1				

<sup>a</sup>Taken from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup>These figures are for the size class 100 and over.

na Not available.

### Average Length of Stay

It has already been shown in this chapter that for the period of this study there was a large increase in the number of admissions per year to the nation's short-term hospitals. Also there was a slight increase in occupancy percentage. These increases become more significant when viewed in connection with the shortened average length of stay.

For all short-term hospitals, the decrease in length of stay was from 9.1 days to 7.6 days, or 16.5 per cent. Length of stay declined in all control groups -- the greatest amount, 21.8 per cent, being shown in governmental hospitals. There may be many reasons for such decrease. Some obvious reasons are that better care became available so that quicker recoveries were effected, or patients were being hospitalized for less severe illnesses hence did not require as long a period of treatment as was formerly required per patient, or better home care was available so that patients could be discharged somewhat sooner.

Table III-30 shows average length of stay for all short-term hospitals as well as for each control category. Per cent change is also shown. Table III-F, Appendix III, shows change in length of stay by service.

Categorized by size, the length of stay for all short-term hospitals is shortest in the very small hospital and increases progressively with size increases. For the entire period, average length of stay varied from 4.6 to 5.8 days in hospitals having fewer than 25 beds. For hospitals having 500 or more beds, the variation was from 9.7 to 17.3 days. Very



little percentage change was recorded in length of stay in the small hospitals while a rather sizeable decrease occurred in the larger hospitals. This pattern generally held for each control classification.

Average length of stay classified by hospital control and size is shown in Tables III-31 through III-34.

### Summary

Capacity of the hospital "industry" expanded roughly at the same rate as did the nation's population between 1946 and 1960. While the number of hospitals increased at a somewhat slower rate than population, bed capacity increased by a slightly larger percentage than population. It may be inferred that the quality of hospital care improved inasmuch as accredited hospitals increased somewhat as a percentage of all short-term hospitals.

Voluntary hospitals, although more numerous than those of any other control category in 1946, became even more predominant by 1960. An increasing proportion of capacity became concentrated in the larger size categories. Thus the large, voluntary hospital became the most important source of supply in the nation's hospital capacity.

Utilization followed essentially the same pattern as capacity with admissions and average daily census having increased. Occupancy percentage remained fairly stable. But the average length of stay was shortened considerably.

TABLE III-30.-Average length of stay in short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent change from 1946<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Average length of stay				
1946	9.1	8.8	6.6	11.4
1947	8.0	8.1	6.4	9.2
1948	8.7	8.5	5.8	11.0
1949	8.3	8.0	5.6	11.2
1950	8.1	7.7	5.6	10.7
1951	8.3	7.8	5.8	11.1
1952	8.1	7.7	5.5	10.7
1953	7.9	7.6	5.6	10.3
1954	7.8	7.5	5.6	9.9
1955	7.8	7.5	5.6	9.7
1956	7.7	7.5	5.6	9.4
1957	7.6	7.4	5.6	9.2
1958	7.6	7.4	5.6	9.0
1959	7.8	7.6	6.0	9.3
1960	7.6	7.4	5.7	8.8
Per cent change from 1946				
1946	0.0	0.0	0.0	0.0
1947	-12.1	-8.0	-3.0	-19.3
1948	-4.4	-3.4	-12.1	-3.5
1949	-8.8	-9.1	-15.2	-1.8
1950	-11.0	-12.5	-15.2	-6.1
1951	-8.8	-11.4	-12.1	-2.6
1952	-11.0	-12.5	-16.7	-6.1
1953	-13.2	-13.6	-15.2	-9.6
1954	-14.3	-14.8	-15.2	-13.2
1955	-14.3	-14.8	-15.2	-14.9
1956	-15.4	-14.8	-15.2	-17.5
1957	-16.5	-15.9	-15.2	-19.3
1958	-16.5	-15.9	-15.2	-21.0
1959	-14.3	-13.6	-9.1	-18.4
1960	-16.5	-15.9	-13.6	-21.8

<sup>a</sup>Source: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue, Vol. 35, Part 2 (Chicago: August 1, 1961), p. 396. Percentages were calculated.

TABLE III-31.-Average length of stay in all short-term general and other special hospitals in the United States, 1946-1960, by size with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Average length of stay												
1946	9.1								6.1	7.2	9.1	11.4
1947	8.0								5.4	6.6	8.0	10.1
1948	8.7								6.0	7.0	8.1	11.5
1949	8.3								5.5	6.8	8.0	10.7
1950	8.1								5.4	6.4	7.4	11.0
1951	8.3								5.7	6.6	7.7	10.9
1952	8.1								5.5	6.4	7.5	10.6
1953	7.9	5.1	5.6	6.3	7.2	8.0	9.1	13.8				
1954	7.8	5.1	5.6	6.3	7.1	7.8	8.8	13.2				
1955	7.8	5.0	5.5	6.3	7.1	7.7	8.6	13.1				
1956	7.7	5.1	5.7	6.3	7.0	7.7	8.5	12.4				
1957	7.6	5.2	5.5	6.3	6.9	7.6	8.5	12.1				
1958	7.6	5.1	5.7	6.3	6.9	7.6	8.4	11.6				
1959	7.8	5.4	6.0	6.7	7.1	7.7	8.4	13.5				
1960	7.6	5.4	5.7	6.3	6.9	7.5	8.2	11.3				





TABLE III-32.-Average length of stay in voluntary short-term general and other special hospitals in the United States, 1946-1960, by size with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25-49	50-99	100-199	200-299	300-499	500 & over	Under 50 bds	50-99	100-249	250 & over
Average length of stay												
1946	8.8								6.7	7.1	9.1	10.1
1947	8.1								6.2	6.8	10.0	11.6
1948	8.5								6.7	7.3	8.3	9.9
1949	8.0								5.7	7.0	8.0	9.1
1950	7.7								5.7	6.5	7.3	9.5
1951	7.8								6.1	6.7	7.6	9.2
1952	7.7								6.0	6.5	7.4	8.9
1953	7.6	5.5	6.0	6.5	7.1	7.8	8.5	10.6				
1954	7.5	5.6	6.0	6.4	7.1	7.6	8.3	10.3				
1955	7.5	5.3	5.8	6.5	7.1	7.6	8.3	10.3				
1956	7.5	5.8	6.0	6.4	7.1	7.6	8.1	10.2				
1957	7.4	5.8	5.9	6.4	7.0	7.4	8.2	10.1				
1958	7.4	5.8	6.0	6.5	6.9	7.4	8.1	9.7				
1959	7.6	na	na	na	na	na	na	na				
1960	7.4	na	na	na	na	na	na	na				

TABLE III-32.-Continued

Per cent change from 1946 and 1953										
1946	0.0							0.0	0.0	0.0
1947	- 8.0							- 7.5	-4.2	9.9
1948	- 3.4							0.0	2.8	- 8.8
1949	- 9.1							-14.9	-1.4	-12.1
1950	-12.5							-14.9	-8.5	-19.8
1951	-11.4							- 9.0	-5.6	-16.5
1952	-12.5							-10.4	-8.5	-18.7
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
1954	- 1.3	1.8	0.00	-1.5	0.0	-2.6	-2.4			-2.8
1955	- 1.3	-3.6	-3.3	0.0	0.0	-2.6	-2.4			-2.8
1956	- 1.3	5.5	0.0	-1.5	0.0	-2.6	-4.7			-3.8
1957	- 2.6	5.5	-1.7	-1.5	-1.4	-5.1	-3.5			-4.7
1958	- 2.6	5.5	0.0	0.0	-2.8	-5.1	-4.7			-8.5
1959	0.0	na	na	na	na	na	na			na
1960	- 2.6	na	na	na	na	na	na			na

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.



TABLE III-33.-Average length of stay in proprietary short-term general and other special hospitals in the United States, 1946-1960, by size with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Average length of stay												
1946	6.6								5.4	7.5	8.1	8.7
1947	6.4								4.9	6.4	7.1	8.8
1948	5.8								5.3	5.7	7.5	8.0
1949	5.6								5.3	5.6	6.7	8.7
1950	5.6								5.0	5.6	7.2	11.6
1951	5.8								5.2	6.0	6.7	10.2
1952	5.5								5.0	5.8	6.7	6.7
1953	5.6	4.7	5.3	5.7	7.0 <sup>b</sup>							
1954	5.6	4.6	5.2	5.9	6.9 <sup>b</sup>							
1955	5.6	4.7	5.2	5.9	6.7 <sup>b</sup>							
1956	5.6	4.6	5.2	5.8	6.8 <sup>b</sup>							
1957	5.6	4.6	5.1	5.7	6.4	7.0	0.0	17.3				
1958	5.6	na	na	na	na	na	na	na				
1959	6.0	na	na	na	na	na	na	na				
1960	5.7	na	na	na	na	na	na	na				

TABLE III-33.-Continued

		Per cent change from 1946 and 1953									
1946	0.0							0.0	0.0	0.0	0.0
1947	-3.0							-9.3	-14.7	-12.3	1.1
1948	-12.1							-1.8	-24.0	-7.4	-8.0
1949	-15.2							-1.8	-25.3	-17.3	0.0
1950	-15.2							-7.4	-25.3	-11.1	33.3
1951	-12.1							-3.7	-20.0	-17.3	17.2
1952	-16.7							-7.4	-22.7	-17.3	-23.0
1953	0.0	0.0	0.0	0.0	0.0						
1954	0.0	-2.1	-1.9	3.5	-1.4 <sup>b</sup>						
1955	0.0	0.0	-1.9	3.5	-4.3 <sup>b</sup>						
1956	0.0	-2.1	-1.9	1.8	-2.9 <sup>b</sup>						
1957	0.0	-2.1	-3.8	0.0	-8.6	na	na	na	na	na	na
1958	0.0	na	na	na	na	na	na	na	na	na	na
1959	7.1	na	na	na	na	na	na	na	na	na	na
1960	1.8	na	na	na	na	na	na	na	na	na	na

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup>These figures are for the size class 100 and over.

na Not available.

TABLE III-34.-Average length of stay in state and local governmental short-term general and other special hospitals in the United States, 1946-1960, by size with per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Average length of stay												
1946	11.4								6.3	7.0	10.4	14.1
1947	9.2								4.9	5.9	7.4	11.8
1948	11.0								5.8	7.1	7.4	15.0
1949	11.2								5.4	6.9	9.3	14.8
1950	10.7								5.3	6.9	8.5	13.7
1951	11.1								6.0	6.6	8.7	15.3
1952	10.7								5.5	6.2	8.4	15.5
1953	10.3	5.2	5.3	6.2	12.6 <sup>b</sup>							
1954	9.9	5.4	5.4	6.2	12.0 <sup>b</sup>							
1955	9.7	5.2	5.4	6.0	11.5 <sup>b</sup>							
1956	9.4	5.3	5.6	6.0	11.2 <sup>b</sup>							
1957	9.2	5.4	5.5	6.1	6.8	8.8	11.0	14.2				
1958	9.0	na	na	na	na	na	na	na				
1959	9.3	na	na	na	na	na	na	na				
1960	8.8	na	na	na	na	na	na	na				



TABLE III-34.-Continued

Per cent change from 1946 and 1953									
1946	0.0						0.0	0.0	0.0
1947	-19.3						-22.2	-15.7	-28.8
1948	-3.5						-7.9	1.4	-28.8
1949	-1.8						-14.3	-1.4	-10.6
1950	-6.1						-15.9	-1.4	-18.3
1951	-2.6						-4.8	-5.7	-13.0
1952	-6.1						-12.7	-11.4	-19.2
1953	0.0	0.0	0.0	0.0	0.0				
1954	-3.9	3.8	1.9	0.0	-4.8 <sup>b</sup>				
1955	-5.8	0.0	1.9	-3.2	-8.7 <sup>b</sup>				
1956	-8.7	1.9	5.7	-3.2	-11.1 <sup>b</sup>				
1957	-10.7	3.8	3.8	-1.6	na	na			na
1958	-12.6	na	na	na	na	na			na
1959	-9.7	na	na	na	na	na			na
1960	-14.6	na	na	na	na	na			na

<sup>a</sup> Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup> These figures are for the size class 100 and over.

na Not available.

## CHAPTER IV

### Personnel, Expenses and Assets in Short-term General and Other Special Hospitals in the United States: 1946-1960

In chapters two and three, information concerning selected changes in the economy and changes in the capacity and utilization of hospitals was presented. In this chapter, the remaining data required for subsequent statistical procedures are presented. Specifically, this chapter develops information concerning the resources, assets and personnel, utilized by hospitals in providing care; and further, it shows the expenses resulting from providing care.

#### Personnel

Available data concerning the number of personnel employed by hospitals is based on incomplete returns of the annual survey questionnaire of the American Hospital Association. From these returns, estimates are made by the Association of the personnel employed by the non-reporting hospitals.<sup>1</sup> However, there is

---

<sup>1</sup>"Technical Notes -- 1960 Annual Survey of Hospitals," Hospitals, Journal of the American Hospital Association, Vol. 35, Part 2 (August 1, 1961), p. 386.

also a need to estimate the error of the estimate of personnel in non-reporting hospitals.

Beginning in 1957, one may estimate at least in a qualitative sense, that the error was very small. Figures selected from Table IV-A of Appendix IV and Table III-21 of chapter III show the following.

TABLE IV-1.-Average daily census

Year (1)	All short-term hospitals (2)	Short-term hospitals reporting personnel	
		Number (3)	% of all (4)
1957	438,048	429,457	98.0
1958	451,144	438,289	97.2
1959	473,721	441,138	93.1
1960	477,437	462,312	96.9

Inasmuch as well over 90.0 per cent of the average daily census of all hospitals was accounted for by hospitals which reported information concerning personnel, errors of estimating the personnel employed in non-reporting hospitals should be rather small. Especially is this true in view of the fact that many of the hospitals which did not report personnel did report other information which would aid in estimating their personnel requirements.

It is presumed that approximately the same relationships existed prior to 1957 although no data were available for those years upon which one



could base any inferences concerning the percentages of total average daily census or total personnel accounted for by reporting hospitals.

One may question why personnel was related to average daily census rather than to hospitals, beds, admissions or some other phenomenon. Correlations between personnel and other phenomena could be computed. But one of the most useful indicators of changes in the hospital field is the ratio of employees to patients. This ratio is determined by dividing personnel by average daily census. Since information concerning average daily census was available, this information was used to obtain a qualitative judgment of the accuracy of personnel figures reported.

#### Full-time Personnel

Total personnel employed on a full-time basis in American hospitals more than doubled during the period of time covered in this study. While there was an increase in all control categories, the growth in personnel employed by voluntary and governmental hospitals was about three times as great in terms of percentage increase as the growth in personnel employed by proprietary hospitals. The net result was growth of about 114 per cent for all short-term hospitals. The numbers of personnel employed as well as the percentage changes are shown in Table IV-2.

The decline in relative importance of the proprietary hospital and the increase in relative importance of the voluntary hospital is shown by the percentage distribution of personnel among the control categories. Although the percentage of employees working in all hospitals constituted increased amounts in the voluntary and governmental hospitals, the increases were

TABLE IV-2.-Total number of full-time personnel in short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent distribution and per cent change from 1946<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Full-time personnel				
1946	504,961	361,834	34,646	108,481
1947	538,670	392,244	35,425	111,001
1948	585,671	427,336	34,317	124,018
1949	596,029	434,585	34,956	126,488
1950	662,456	473,198	41,270	147,988
1951	647,878	464,238	37,939	145,701
1952	673,531	485,996	38,847	148,688
1953	719,406	520,429	39,774	159,203
1954	777,215	567,871	39,877	169,467
1955	826,000	597,000	41,000	188,000
1956	878,110	638,821	41,384	197,905
1957	926,000	680,000	43,000	203,000
1958	984,000	720,000	45,000	219,000
1959	1,031,215	758,473	45,786	226,956
1960	1,080,255	791,873	47,516	240,866
Per cent distribution				
1946		71.7	6.9	21.5
1947		72.8	6.6	20.6
1948		73.0	5.9	21.2
1949		72.9	5.9	21.2
1950		71.4	6.2	22.3
1951		71.7	5.9	22.5
1952		72.2	5.8	22.1
1953		72.3	5.5	22.1
1954		73.1	5.1	21.8
1955		72.3	5.0	22.8
1956		72.7	4.7	22.5
1957		73.4	4.6	21.9
1958		73.2	4.6	22.3
1959		73.6	4.4	22.0
1960		73.3	4.4	22.3

TABLE IV-2.-Continued

Year	Total	Voluntary	Proprietary	Governmental
1946	0.0	0.0	0.0	0.0
1947	6.7	8.4	2.2	2.3
1948	16.0	18.1	-0.9	14.3
1949	18.0	20.1	0.9	16.6
1950	31.2	30.8	19.1	36.4
1951	28.3	28.3	9.5	34.3
1952	33.4	34.3	12.1	37.1
1953	42.5	43.8	14.8	46.8
1954	53.9	56.9	15.1	56.2
1955	63.6	65.0	18.3	73.3
1956	73.9	76.6	19.4	82.4
1957	83.4	87.9	24.1	87.1
1958	94.9	99.0	29.9	101.9
1959	104.2	109.7	32.2	109.2
1960	113.9	118.8	37.1	122.0

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

small being 1.6 per cent and 0.8 per cent respectively. The drop in proprietary employees as a per cent of total employees from 6.9 to 4.4 is quite significant. In view of other changes previously cited, this decline in percentage of hospital personnel employed by proprietary hospitals suggests that the proprietary hospital is assuming an increasingly smaller role among the nation's hospitals while the voluntary community hospital's role is increasing in importance.

Table II-7 shows that the total non-institutional adult population increased by 17.7 per cent from 1946 to 1960. During the same time period, the total civilian labor force increased by 22.8 per cent and the non-



agricultural labor force increased 29.9 per cent. An increase of 113.9 per cent for the personnel employed by hospitals for this same period suggests that hospitals, while requiring only a small portion of the total labor force, are increasing in importance as a user of labor. In 1946, 1.1 per cent of the total non-agricultural labor force was employed by hospitals. This percentage had increased to 1.8 by 1960.

In chapter three, it was shown that larger hospitals are increasing more rapidly among the number of American hospitals than are the relatively small hospitals. That fact coupled with the increased number of employees suggests that there may be increasingly difficult administrative problems arising in the future. As an example of such problems, it was during the period of time encompassed by this study that the first serious efforts were made by labor unions to organize hospital employees.

Information concerning the number of personnel employed in the various types of hospitals was not available until 1957. It is shown in Appendix IV, Table IV-E. No really valid conclusions can be drawn from the information since such a short period of time is reported. However, such data as are available reinforce those shown in Appendix III, Tables III-A through III-E, which suggest that the functions of the special purpose hospital such as maternity, orthopedic, et cetera are increasingly being performed by the general hospital.

During the early years of this study, personnel employed by the small hospitals increased more rapidly in percentage growth than did the per-

TABLE IV-3.-Full-time personnel (in thousands) of short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Full-time personnel												
1946	505								37	65	181	222
1947	539								39	69	197	234
1948	586								42	72	202	270
1949	596								44	75	214	263
1950	662								48	82	234	298
1951	648								54	88	229	277
1952	674								56	89	237	291
1953	719	13	43	93	177	139	132	122				
1954	777	14	46	96	194	153	149	124				
1955	826	14	47	99	198	166	163	137				
1956	878	13	50	107	203	180	177	149				
1957	926	14	52	113	212	191	190	155				
1958	984	14	55	117	221	198	205	174				
1959	1,037	14	59	124	237	204	219	180				
1960	1,080	13	58	128	234	217	239	191				
Per cent distribution												
1946									7.3	12.8	35.9	44.0
1947									7.2	12.7	36.6	43.5
1948									7.2	12.2	34.5	46.1
1949									7.4	12.5	35.9	44.2
1950									7.3	12.4	35.4	44.9
1951									8.3	13.6	35.4	42.8
1952									8.3	13.2	35.2	43.3





TABLE IV-4.-Full-time personnel (in thousands) of voluntary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Full-time personnel												
1946	362								17	46	155	144
1947	392								18	49	169	156
1948	427								20	51	174	183
1949	435								20	53	185	176
1950	473								19	57	204	194
1951	464								24	62	193	185
1952	486								25	61	200	201
1953	520	5	20	63	144	121	112	56				
1954	568	5	22	64	160	132	125	58				
1955	597	5	22	67	160	143	138	61				
1956	639	4	23	73	162	153	152	71				
1957	680	5	26	78	170	163	164	74				
1958	720	5	27	80	177	171	177	84				
1959	758	na	na	na	na	na	na	na				
1960	792	5	28	85	183	186	207	97				
Per cent distribution												
1946									4.6	12.8	42.9	39.7
1947									4.6	12.4	43.2	39.8
1948									4.6	11.9	40.8	42.7
1949									4.6	12.2	42.6	40.6
1950									4.0	12.0	43.0	41.0
1951									5.2	13.4	41.6	39.8
1952									5.2	12.5	41.1	41.3



TABLE IV-5.-Full-time personnel (in thousands) of proprietary short-term general and other special hospitals of the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Full-time personnel												
1946	35								14	9	9	2
1947	35								15	9	10	1
1948	34								16	9	9	c
1949	35								16	10	9	c
1950	41								19	12	9	1
1951	38								18	11	8	1
1952	39								19	10	8	1
1953	40	7	12	11	10 <sup>b</sup>							
1954	40	7	12	10	11 <sup>b</sup>							
1955	41	6	13	11	11 <sup>b</sup>							
1956	41	6	13	11	12 <sup>b</sup>							
1957	43	6	12	12	10	2	0	c				
1958	45	na	na	na	na	na	na	na				
1959	46	na	na	na	na	na	na	na				
1960	48	5	13	15	11	2	c	c				
Per cent distribution												
1946									40.7	26.7	26.2	6.5
1947									43.6	25.6	27.4	3.3
1948									46.2	26.6	26.5	0.7
1949									46.5	28.3	24.5	0.8
1950									47.2	28.5	22.6	1.8
1951									48.3	27.8	21.6	2.3
1952									48.7	26.4	21.1	3.8





TABLE IV-6.-Full-time personnel (in thousands) of state and local governmental short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Full-time personnel												
1946	108								6	9	17	76
1947	111								5	11	18	77
1948	124								6	12	19	87
1949	126								8	12	20	87
1950	148								10	14	22	103
1951	146								11	15	28	92
1952	149								12	18	29	89
1953	159	2	10	19	127 <sup>b</sup>							
1954	169	3	11	21	134 <sup>b</sup>							
1955	188	2	12	22	152 <sup>b</sup>							
1956	198	3	14	23	158 <sup>b</sup>							
1957	203	3	14	23	31	25	26	80				
1958	219	na	na	na	na	na	na	na				
1959	227	na	na	na	na	na	na	na				
1960	241	3	17	28	39	28	32	93				
Per cent distribution												
1946									5.4	8.7	15.7	70.3
1947									4.8	9.7	16.1	69.4
1948									5.2	9.4	15.1	70.3
1949									6.0	9.5	16.0	68.5
1950									6.4	9.4	14.5	69.6
1951									7.5	10.6	19.0	62.9
1952									8.0	12.2	19.7	60.1





centage growth of personnel in large hospitals. However, just the opposite was true during the second half of the period. These figures are shown in Table IV-3. The final result for the entire period was a more rapid increase by the larger hospitals. This can be ascertained by combining the per cent distribution figures for the under 25 and the 25-49 categories and comparing with the under 50 category at the beginning of the period. The ending percentage was 6.6 while the beginning figure was 7.3. In the 50-99 size, the beginning and ending figures were 12.8 and 11.9 respectively. There is no meaningful way to compare the other categories except as an aggregate. The beginning and ending percentages for all hospitals 100 beds and larger were 79.9 and 81.5. While the percentage changes are not very large, they are consistent with an already familiar pattern of increasing growth in larger hospitals with a concomitant decline in the smaller hospitals.

Voluntary hospitals, as shown in Table IV-4, showed essentially the same pattern as that mentioned above manifested by all hospitals. However, the growth of the larger hospitals and decrease by the smaller hospitals seem to have begun somewhat sooner. By 1952, the largest size group was employing relatively more of all hospital personnel than in 1946 while the 50-99 group was employing relatively less. By the end of the period, the under 50 group employed only 4.2 per cent as compared to 4.6 per cent in 1946, while the 50-99 group had dropped two full percentage points from 12.8 to 10.8 between 1946 and 1960. Hospitals 100 beds and

larger increased from 82.6 per cent in 1946 to 85.0 per cent of personnel employed in all voluntary hospitals in 1960.

Proprietary hospitals reversed the changes experienced by voluntary hospitals. Although the relative percentage of employees in the under 50 beds group declined from 40.7 to 38.3, the increase in the 50-99 group, from 26.7 per cent to 31.1 per cent, was sufficiently large to increase the percentage for the small groups combined to 69.4 in 1960 while it had been only 67.4 in 1946. These changes are shown in Table IV-5.

The same general changes observed among the proprietary hospitals occurred in the governmental hospitals except to a greater degree. See Table IV-6. The percentage of employees in hospitals having fewer than 50 beds increased from 5.4 per cent in 1946 to 8.2 per cent in 1960. The increase was from 8.7 to 11.8 in the 50-99 size. Hospitals 100 beds and larger experienced a decline from 85.9 to 80.0 per cent of personnel employed. This is even more significant when it is remembered that the greatest increase in total personnel employed occurred in the governmental hospitals.

#### Full-time Personnel Per 100 Patients

As was indicated earlier, a useful measure of hospital personnel changes is the ratio of employees to patients. This ratio is usually expressed as the total number of full-time personnel per 100 patients. Table IV-7 shows the changes in personnel per 100 patients for all short-term hospitals as a total and by control. The increase was sizeable in all control categories, but was largest in governmental hospitals.

TABLE IV-7.-Total number of full-time personnel per 100 patients in short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent change from 1946<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Full-time personnel per 100 patients				
1946	148	156	137	129
1947	151	161	139	126
1948	162	173	145	136
1949	169	180	152	144
1950	178	191	161	149
1951	171	181	155	151
1952	175	184	162	153
1953	183	193	161	161
1954	198	207	178	175
1955	203	210	182	188
1956	207	213	179	195
1957	211	218	185	197
1958	218	224	189	206
1959	223	229	195	210
1960	226	232	196	215
Per cent change from 1946				
1946	0.0	0.0	0.0	0.0
1947	2.0	3.2	1.5	-2.3
1948	9.5	10.9	5.8	5.4
1949	14.2	15.4	10.9	11.6
1950	20.3	22.4	17.5	15.5
1951	15.5	16.0	13.1	17.1
1952	18.2	17.9	18.2	18.6
1953	23.6	23.7	17.5	24.8
1954	33.8	32.7	29.9	35.7
1955	37.2	34.6	32.8	45.7
1956	39.9	36.5	30.7	51.2
1957	42.6	39.7	35.0	52.7
1958	47.3	43.6	38.0	59.7
1959	50.7	46.8	42.3	62.8
1960	52.7	48.7	43.1	66.7

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).



In 1946, 156 employees were required by voluntary hospitals to care for 100 patients. By 1960, the number of employees to care for the same number of patients had increased to 232. The change in proprietary hospitals was from 137 to 196; and, in governmental hospitals the increase was from 129 to 215. The percentage increases were respectively 48.7, 43.1 and 66.7 for these three control classifications.

One may speculate that there could be many causes for the increase. Some of the causes may be: (1) Employees became less efficient, (2) hospitals adopted a shorter work-week for their employees, (3) as the average length of stay decreased, more employees were required to render the intensive care needed by patients, (4) hospitals' patient composition changed so that a greater percentage of more difficult cases were being treated, (5) technological change required an increase in personnel, (6) better care was being given patients, hence a greater number of employees were required per patient.

To discover the causes for such change should provide a fruitful field for additional research.

The preceding list is by no means intended to be exhaustive. It is rather only suggestive of what one may suppose to be the cause of change. The writer suggests also that there is some relationship between size of hospital and number of employees per 100 patients as well as between type of service rendered and employees per 100 patients.

The limited information available concerning employees per 100 patients in the various service classifications is shown in Table IV-F of Appendix IV.

From this information, one may conclude that hospitals providing services for treatment of patients having acute illnesses or surgery require a greater number of employees per patient than do hospitals which perform services consisting to a large extent of custodial services, e.g., maternity -- over 300 employees per 100 patients, orthopedic -- 250 to 300 employees per 100 patients, psychiatric -- slightly over 100 employees per 100 patients.

Inasmuch as the general hospital provides both kinds of services -- acute and custodial -- one would expect that the composition of the patient load would to a large extent determine the number of employees required per 100 patients.

Table IV-8 reveals that for all short-term hospitals, the number of employees per patient increases from the smallest hospital, under 25 beds, to the second largest size group, 300-499, then decreases in the largest group. The most rapid percentage increase in employees per patient occurred in the 500 and over size hospital, at least during the latter years included in this study.

Among voluntary hospitals this pattern was changed slightly in that the number of employees per patient showed a continuing increase from the smallest to the largest size groupings. However, among voluntary hospitals, the largest percentage changes occurred among the smaller hospitals throughout the entire period of time covered in the study. See Table IV-9.

The smaller proprietary hospitals exhibited essentially the same pattern as did the smaller voluntary hospitals. However, there were marked differ-

ences between the larger hospitals. One may observe that in 1960 the following differences were apparent in the number of employees per 100 patients.

	<u>100-199</u>	<u>200-299</u>	<u>300-499</u>	<u>500 &amp; over</u>
Voluntary	230	237	237	245
Proprietary	197	175	178	89

This same general pattern was evident also in 1957, the only other year for which comparable data are available.

The greatest amount of increase in employees per patient in the proprietary hospital, as in the voluntary hospital, occurred in the smaller size groups. Table IV-10 shows information concerning personnel per patient in proprietary hospitals.

From a situation in 1946 such that governmental hospitals employed fewer workers per 100 patients than did either voluntary or proprietary hospitals, there were changes so that by 1960 employees per 100 patients were greater in governmental hospitals than in proprietary in all size categories but one, 50-99 beds. When compared with voluntary hospitals in 1960, governmental hospitals had more employees per patient in only two size categories. However, whether voluntary or governmental hospitals had a greater number of employees per patient, in only one size category, 500 and over, was there a very great difference in the number -- 207 in governmental and 245 in voluntary. Again, the largest percentage increase was made by the smaller sized hospital. See Table IV-11.



TABLE IV-8.-Full-time personnel per 100 patients in short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Full-time personnel per 100 patients										
		Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
1946	148								117	132	153	157
1947	151								120	130	154	174
1948	162								131	141	161	177
1949	169								131	154	172	181
1950	178								146	162	188	182
1951	171								150	168	177	173
1952	175								160	166	180	177
1953	183	157	160	174	189	196	190	172				
1954	198	175	175	187	208	211	205	182				
1955	203	181	179	191	206	216	214	193				
1956	207	168	182	194	207	220	219	199				
1957	211	188	184	200	213	223	223	204				
1958	218	190	189	201	218	229	232	216				
1959	223	203	196	207	224	232	234	200				
1960	226	198	197	213	227	235	237	225				

TABLE IV-8.-Continued

Per cent change from 1946 and 1953										
1946	0.0							0.0	0.0	0.0
1947	2.0							2.6	-1.5	0.7
1948	9.5							12.0	6.8	5.2
1949	14.2							12.0	16.7	12.4
1950	20.3							24.8	22.7	22.9
1951	15.9									
1952	18.2							28.2	27.3	15.7
1953	0.0							36.8	25.8	17.6
1954	8.2	0.0	0.0	0.0	0.0	0.0	0.0			
1955	10.9	11.5	9.4	7.5	10.1	7.7	7.9			
		15.3	11.9	9.8	9.0	10.2	12.6			
1956	13.1	7.0	13.8	11.5	9.5	12.2	15.3			
1957	15.3	19.7	15.0	14.9	12.7	13.8	17.4			
1958	19.1	21.0	18.1	15.5	15.3	16.8	22.1			
1959	21.9	29.3	22.5	19.0	18.5	18.4	23.2			
1960	23.5	26.1	23.1	22.4	20.1	19.9	24.7			

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

TABLE IV-9.-Full-time personnel per 100 patients of voluntary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Full-time personnel per 100 patients												
1946	156								112	136	156	172
1947	161								117	131	157	181
1948	173								129	143	164	209
1949	180								133	153	176	205
1950	191								132	164	194	208
1951	181								152	171	180	190
1952	184								158	166	183	197
1953	193	158	159	175	192	198	197	218				
1954	207	168	174	190	210	213	208	223				
1955	210	183	176	191	208	216	216	228				
1956	213	152	176	193	207	220	221	236				
1957	218	187	187	203	215	224	225	233				
1958	224	192	190	205	221	231	232	237				
1959	229	na	na	na	na	na	na	na				
1960	232	201	199	215	230	237	237	245				



TABLE IV-9. -Continued

Per cent change from 1946 and 1953										
1946	0.0							0.0	0.0	0.0
1947	3.2							4.5	-3.7	0.6
1948	10.9							15.2	5.1	5.1
1949	15.4							18.8	12.5	12.8
1950	22.4							17.9	20.6	24.4
1951	16.0							35.7	25.7	15.4
1952	17.9							41.1	22.1	17.3
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
1954	7.3	6.3	9.4	8.6	7.6	5.6	4.6			
1955	8.8	15.8	10.7	9.1	9.1	9.6	4.6			
1956	10.4	-3.8	10.7	10.3	7.8	11.1	12.2			8.3
1957	13.0	18.4	17.6	16.0	12.0	13.1	14.2			6.9
1958	16.1	21.5	19.5	17.1	15.1	16.7	17.8			8.7
1959	18.7	na	na	na	na	na	na			na
1960	20.2	27.2	25.2	22.9	19.8	19.7	20.3			12.4

<sup>a</sup> Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.

TABLE IV-10.-Full-time personnel per 100 patients of proprietary short-term general and other special hospitals of the United States, 1946-1960, by size, with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Full-time personnel per 100 patients												
1946	137								127	132	153	178
1947	139								129	137	156	130
1948	145								136	143	168	132
1949	152								129	176	185	122
1950	161								160	167	165	92
1951	155								151	165	163	100
1952	162								163	162	159	166
1953	161	155	158	168	162 <sup>b</sup>							
1954	178	176	172	173	190 <sup>b</sup>							
1955	182	178	177	187	184 <sup>b</sup>							
1956	179	172	181	191	171 <sup>b</sup>							
1957	185	183	177	194	194	179	0	102				
1958	189	na	na	na	na	na	na	na				
1959	195	na	na	na	na	na	na	na				
1960	196	194	191	210	197	175	178	89				

TABLE IV--10. Continued

1946	0.0					0.0	0.0	0.0	0.0	0.0
1947	1.4					1.6	3.8	2.0	-27.0	
1948	5.8					7.1	8.3	9.8	-25.8	
1949	10.9					1.6	33.3	20.9	-31.5	
1950	17.5					26.0	26.5	7.8	-48.3	
1951	13.1					18.9	25.0	6.5	-43.8	
1952	18.2					28.3	22.7	3.9	-6.7	
1953	0.0	0.0	0.0	0.0	0.0					
1954	10.6	13.5	8.9	3.0	17.3 <sup>b</sup>					
1955	13.0	14.8	12.0	11.3	13.6 <sup>b</sup>					
1956	11.2	11.0	14.6	13.7	5.6 <sup>b</sup>					
1957	14.9	18.1	12.0	15.5	19.8	na	na	na		
1958	17.4	na	na	na	na	na	na	na		
1959	21.1	na	na	na	na	na	na	na		
1960	21.7	25.2	20.9	25.0	21.6	na	na	na		

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.

<sup>b</sup>Refers to the size class 100 and over.



TABLE IV-11.-Full-time personnel per 100 patients of state and local governmental short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Full-time personnel per 100 patients										
		Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
1946	129							109	116	124	134	
1947	126							109	125	125	130	
1948	136							123	130	131	140	
1949	144							129	142	141	147	
1950	149							152	151	152	148	
1951	151							146	159	164	146	
1952	153							159	168	169	145	
1953	161	162	166	176	158 <sup>b</sup>							
1954	175	190	181	188	173 <sup>b</sup>							
1955	188	188	186	194	188 <sup>b</sup>							
1956	195	195	195	197	195 <sup>b</sup>							
1957	197	197	187	194	209	224	214	184				
1958	206	na	na	na	na	na	na	na				
1959	210	na	na	na	na	na	na	na				
1960	215	202	199	206	223	229	243	207				

TABLE IV-11.-Continued

Per cent change from 1946 and 1953									
1946	0.0							0.0	0.0
1947	-2.3							0.0	7.8
1948	5.4							12.8	12.1
1949	11.6							18.3	22.4
1950	15.5							39.4	30.2
1951	17.1							33.9	37.1
1952	18.6							45.9	44.8
1953	0.0	0.0	0.0	0.0	0.0				
1954	8.7	17.3	9.0	6.8	9.5 <sup>b</sup>				
1955	16.8	16.0	12.0	10.2	19.0 <sup>b</sup>				
1956	21.1	20.4	17.5	11.9	23.4 <sup>b</sup>				
1957	22.4	21.6	12.7	10.2	32.3	na	na	na	na
1958	28.0	na	na	na	na	na	na	na	na
1959	30.4	na	na	na	na	na	na	na	na
1960	33.5	24.7	19.9	17.0	41.1	na	na	na	na

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup>Refers to size class 100 and over.

naNot available.

ExpensesTotal Expense

Total expense for all care in the hospitals included in this study increased from \$1.2 billion in 1946 to \$5.6 billion in 1960, an increase of 380 per cent. As shown in Table IV-12, large increases in

TABLE IV-12.-Total expense (in thousands of dollars) of all short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent distribution and per cent change from 1946<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Total expense				
1946	1,168,549	848,093	93,657	226,799
1947	1,434,120	1,048,316	109,408	276,396
1948	1,723,609	1,263,940	118,988	340,681
1949	1,841,867	1,333,372	125,230	383,265
1950	2,120,481	1,523,109	143,321	454,051
1951	2,313,640	1,688,450	139,281	485,909
1952	2,577,203	1,879,001	151,464	546,738
1953	2,867,948	2,079,692	169,016	619,240
1954	3,120,598	2,276,457	161,608	682,533
1955	3,434,000	2,508,000	174,000	752,000
1956	3,743,000	2,739,000	188,000	816,000
1957	4,161,000	3,050,000	200,000	911,000
1958	4,655,000	3,427,000	225,000	1,003,000
1959	5,091,346	3,759,562	242,383	1,089,401
1960	5,616,940	4,139,430	274,793	1,202,717
Per cent distribution				
1946		72.6	8.0	19.4
1947		73.1	7.6	19.3
1948		73.3	6.9	19.8
1949		72.4	6.8	20.8
1950		71.8	6.8	21.4



TABLE IV-12.-Continued

Year	Total	Voluntary	Proprietary	Governmental
1951		72.9	6.0	21.0
1952		72.9	5.9	21.2
1953		72.5	5.9	21.6
1954		72.9	5.2	21.9
1955		73.0	5.1	21.9
1956		73.2	5.0	21.8
1957		73.3	4.8	21.9
1958		73.6	4.8	21.5
1959		73.9	4.8	21.4
1960		73.7	4.9	21.4
Per cent change from 1946				
1946	0.0	0.0	0.0	0.0
1947	22.7	23.6	16.0	21.6
1948	47.5	49.1	26.6	50.2
1949	57.6	57.2	33.0	68.7
1950	81.4	79.6	52.0	100.0
1951	97.9	99.1	47.9	114.1
1952	120.4	121.6	60.6	141.0
1953	145.3	145.3	79.8	172.7
1954	167.0	168.4	72.3	200.9
1955	193.8	195.8	85.1	231.3
1956	220.2	223.0	100.1	259.5
1957	255.9	259.7	112.8	301.3
1958	298.2	304.1	139.4	341.9
1959	335.5	343.4	157.4	379.7
1960	380.5	388.0	192.6	430.0

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

expenses of all control categories occurred. Voluntary hospitals' expenses increased from \$848 million to \$4,139 million while proprietary and governmental, respectively, increased from \$93.7 million to \$274.8 million and from \$226.8 million to \$1,202.7 million. The respective percentage increases for all three control groups were 388.0, 192.6 and 430.0.

Some percentage amount between 71.8 and 73.9 of all expenses was incurred in voluntary hospitals each year. Voluntary hospitals as a percentage of all short-term hospitals varied between 57.1 and 60.9. They contained between 63.6 and 69.8 per cent of all short-term beds. Of all patients admitted, between 68.7 and 73.7 per cent were admitted to voluntary hospitals. Finally, average daily census in voluntary hospitals constituted between 66.4 and 71.6 per cent of the average daily census in all short-term hospitals. Hence, it appears that a disproportionately large percentage of all hospital expenses was incurred in voluntary hospitals.

The expense percentage of proprietary hospitals to all hospitals dropped from 8.0 to 4.9 during the 15 years of this study while the governmental percentage increased from 19.4 to 21.4. Thus, the familiar pattern of increasingly large roles played by voluntary and governmental hospitals at the expense of proprietary hospitals is seen again.

Not much can be said about the distribution of expenses according to service classifications inasmuch as such data are available only from 1957. Such information as is available is shown in Appendix IV, Table IV-H. It reveals that non-federal short-term hospitals generated a decreasing per-

centage of all expenses -- down from 92.8 per cent in 1958 to 88.1 per cent in 1960. Of the non-federal expenses almost all were incurred in general hospitals. In 1958, non-federal hospitals excluding general hospitals accounted for 3.1 per cent of all short-term hospital expenses. This same group of hospitals in 1960 accounted for only 2.9 per cent of expenses.

Expenses of non-federal short-term hospitals classified by size, Table IV-13, increased throughout the entire period of the study. However, the greatest increases, in dollars as well as percentages, occurred among the larger size groupings. For the eight years ending in 1960, the percentage increases were 99.1, 135.9 and 113.5 respectively for size categories 200-299, 300-499 and 500 and over.

Expenses incurred in voluntary hospitals during 1953, in dollar amounts, were relatively greatest in the 100-199, 200-299 and 300-499 size classifications. They were still the largest, by far, in 1960. However, the rankings had changed. In 1953, \$561 million of expense were incurred in the 100-199 size, \$494 million in 200-299 and \$450 million in the 300-499 group. By 1960, \$1,094 million of expenses arose from the 300-499 group, \$975 million from the 200-299 and \$937 million from the 100-199 size.

The largest percentage changes occurred in the 300-499 and 500 and over sizes. They were increases respectively of 143.1 and 132.8 per cent.

Table IV-14 shows information concerning expenses for voluntary hospitals. Table IV-15 presents expense information of proprietary hospitals.



TABLE IV-13.-Total expense (in millions of dollars) of all short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total expense												
1946	1,169								102	158	416	492
1947	1,434								129	194	536	575
1948	1,724								135	226	595	768
1949	1,842								151	246	653	792
1950	2,120								179	282	741	919
1951	2,314								193	299	816	1,005
1952	2,577								207	335	909	1,126
1953	2,868	53	170	364	690	568	532	490				
1954	3,121	55	181	370	740	627	613	534				
1955	3,434	59	191	392	804	704	686	597				
1956	3,743	57	205	432	879	768	748	654				
1957	4,161	60	227	486	935	858	857	738				
1958	4,655	62	258	543	1,032	941	973	845				
1959	5,120	65	279	593	1,147	1,010	1,097	929				
1960	5,617	64	295	642	1,184	1,131	1,255	1,046				
Per cent distribution												
1946									8.7	13.5	35.6	42.1
1947									9.0	13.5	37.4	40.1
1948									7.8	13.1	34.5	44.5
1949									8.2	13.4	35.5	43.0
1950									8.4	13.3	35.0	43.3
1951									8.3	12.9	35.3	43.4
1952									8.0	13.0	35.3	43.7

TABLE IV-13.-Continued

	Per cent change from 1946 and 1953										
	1.8	5.9	12.7	24.1	19.8	18.5	17.1				
1953											
1954	1.8	5.8	11.9	23.7	20.1	19.6	17.1				
1955	1.7	5.6	11.4	23.4	20.5	20.0	17.4				
1956	1.5	5.5	11.5	23.5	20.5	20.0	17.5				
1957	1.4	5.5	11.7	22.5	20.6	20.6	17.7				
1958	1.3	5.5	11.7	22.2	20.2	20.9	18.2				
1959	1.3	5.4	11.6	22.4	19.7	21.4	18.1				
1960	1.1	5.3	11.4	21.1	20.1	22.4	18.6				
Per cent change from 1946 and 1953											
1946	0.0							0.0	0.0	0.0	0.0
1947	22.7							26.5	22.8	28.8	16.9
1948	47.5							32.4	43.0	43.0	56.1
1949	57.6							48.0	55.7	57.0	61.0
1950	81.5							75.5	78.5	78.1	86.8
1951	98.0							89.2	89.2	96.2	104.3
1952	120.5							102.9	112.0	118.5	128.9
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
1954	8.8	3.1	1.6	7.2	10.4	15.2	9.2				
1955	19.7	10.5	7.6	16.5	23.9	28.9	21.8				
1956	30.1	7.7	18.5	27.4	35.2	40.6	33.5				
1957	45.1	13.1	33.3	35.5	51.5	61.1	50.6				
1958	62.3	17.0	49.0	49.6	65.7	82.9	72.4				
1959	78.5	22.7	64.3	66.3	77.8	106.2	89.6				
1960	95.9	19.4	73.6	71.6	99.1	135.9	113.5				

<sup>a</sup> Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

TABLE IV-14.--Total expense (in millions of dollars) of voluntary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total expense												
1946	848								45	108	357	339
1947	1,048		78	243	561	494	450	235	59	139	455	396
1948	1,264		88	246	614	543	520	247	61	155	508	541
1949	1,333		90	265	654	611	581	281	63	169	556	546
1950	1,523		96	295	679	667	654	325	77	193	637	616
1951	1,688		113	335	757	736	742	345	86	207	698	697
1952	1,879		128	369	828	812	848	418	93	228	771	787
1953	2,080	18										
1954	2,276	19										
1955	2,508	25										
1956	2,739	23										
1957	3,050	23										
1958	3,427	23										
1959	3,760	na	na	na	na	na	na	na				
1960	4,139	25	140	423	937	975	1,094	547				
Per cent distribution												
1946									5.3	12.7	42.1	40.0
1947									5.6	13.3	43.4	37.8
1948									4.8	12.3	40.2	42.8
1949									4.7	12.7	41.7	41.0
1950									5.1	12.7	41.8	40.4
1951									5.1	12.3	41.4	41.3
1952									4.9	12.1	41.0	41.9





TABLE IV-15.-Total expense (in millions of dollars) of proprietary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total expense												
1946	94								41	27	20	5
1947	109								52	26	27	4
1948	119								54	32	31	1
1949	125								61	33	28	2
1950	143								66	41	33	3
1951	139								68	40	27	5
1952	151								70	43	33	6
1953	169	27	53	46	42 <sup>b</sup>							
1954	162	27	49	44	42 <sup>b</sup>							
1955	174	25	56	45	47 <sup>b</sup>							
1956	188	23	61	49	55 <sup>b</sup>							
1957	200	25	57	55	47	11	0	4				
1958	225	na	na	na	na	na	na	na				
1959	242	na	na	na	na	na	na	na				
1960	275	25	76	87	68	14	2	4				
Per cent distribution												
1946									43.5	28.8	21.8	5.9
1947									47.8	23.7	25.0	3.5
1948									45.7	27.0	26.3	1.1
1949									49.0	26.7	22.4	1.8
1950									46.1	28.6	23.0	2.2
1951									48.6	28.5	19.6	3.3
1952									46.4	28.3	21.7	3.6

TABLE IV-15. -Continued

Per cent change from 1946 and 1953									
1953	16.0	31.6	27.4	25.0 <sup>b</sup>					
1954	16.5	30.6	27.1	25.7 <sup>b</sup>					
1955	14.4	32.4	26.2	27.0 <sup>b</sup>					
1956	12.4	32.3	26.1	29.2 <sup>b</sup>					
1957	12.6	28.6	27.7	23.6	5.5	0.0	2.0		
1958	na	na	na	na	na	na	na		
1959	na	na	na	na	na	na	na		
1960	9.1	27.5	31.5	24.8	4.9	0.8	1.3		
1946	0.0							0.0	0.0
1947	16.8							-3.7	33.9
1948	27.0							19.1	53.1
1949	33.7							24.3	37.5
1950	53.0							52.1	61.7
1951	48.7							47.4	33.7
1952	61.7							58.8	61.0
1953	0.0	0.0	0.0	0.0					
1954	-4.4	-7.2	-5.5	-1.6 <sup>b</sup>					
1955	2.8	5.7	-1.9	10.8 <sup>b</sup>					
1956	11.2	14.0	5.7	29.8 <sup>b</sup>					
1957	18.4	7.4	19.6	46.9 <sup>b</sup>	na	na	na		
1958	33.1	na	na	na	na	na	na		
1959	43.4	na	na	na	na	na	na		
1960	62.6	-7.5	41.9	107.1 <sup>b</sup>	na	na	na		

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.

<sup>b</sup>Refers to the size class 100 and over.



TABLE IV-16.-Total expense (in millions of dollars) of state and local governmental short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Total expense										500 & over	Under 50 bds	50-99	100-249	250 & over
		Under 25 bds	25-49	50-99	100-199	200-299	300-499	500 & over	Under 50 bds	50-99	100-249					
1946	227								17	23	39					148
1947	276								18	29	54					176
1948	341								20	39	56					226
1949	383								27	44	69					244
1950	454								36	48	71					300
1951	486								40	52	91					303
1952	547								43	65	106					333
1953	619	9	39	75	497 <sup>b</sup>											
1954	683	10	43	80	549 <sup>b</sup>											
1955	752	9	44	82	618 <sup>b</sup>											
1956	816	10	50	88	668 <sup>b</sup>											
1957	911	12	56	96	131	111	115	389								
1958	1,003	na	na	na	na	na	na	na								
1959	1,089	na	na	na	na	na	na	na								
1960	1,203	13	80	132	179	143	160	496								
Per cent distribution																
1946									7.3	10.3	17.2					65.2
1947									6.4	10.5	19.5					63.6
1948									5.8	11.4	16.4					66.4
1949									7.1	11.4	17.9					63.6
1950									7.9	10.5	15.6					66.0
1951									8.1	10.7	18.7					62.4
1952									7.9	11.8	19.3					60.9

**TABLE IV-16.-Continued**

Per cent change from 1946 and 1953										
1953	1.4	6.3	12.1	80.2 <sup>b</sup>						
1954	1.4	6.4	11.8	80.5 <sup>b</sup>						
1955	1.2	5.9	10.8	82.1 <sup>b</sup>						
1956	1.3	6.1	10.7	81.9 <sup>b</sup>						
1957	1.3	6.2	10.5	14.3	12.2	12.6	42.8			
1958	na	na	na	na	na	na	na			
1959	na	na	na	na	na	na	na			
1960	1.1	6.6	11.0	14.9	11.9	13.3	41.2			
1946	0.0							0.0	0.0	0.0
1947	21.9							6.0	25.3	38.5
1948	50.2							19.5	67.0	43.2
1949	69.0							63.1	87.7	76.1
1950	100.2							114.8	106.0	81.8
1951	114.2							137.3	123.7	133.6
1952	141.1							160.6	177.9	171.0
1953	0.0	0.0	0.0	0.0						
1954	5.7	11.0	7.8	10.5 <sup>b</sup>						
1955	21.6	13.8	9.4	24.3 <sup>b</sup>						
1956	31.8	27.6	17.5	34.4 <sup>b</sup>						
1957	47.2	44.3	28.2	50.3 <sup>b</sup>	na	na	na			
1958	62.0	na	na	na	na	na	na			
1959	75.9	na	na	na	na	na	na			
1960	94.3	104.3	77.1	96.8 <sup>b</sup>	na	na	na			

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup>Refers to the size class 100 and over.

na Not available.

It appears that all proprietary hospital size groups may have had increased expenses at the end of the period as compared to 1946; however, data are not in comparable form for the entire time. Therefore, no unqualified statement to this effect can be made. But from 1953, all sizes increased except the under 25 beds group which declined by 7.5 per cent. The other sizes did not increase very much in terms of dollars. Their percentage increases also were generally rather small when compared with percentage increases of voluntary hospital expense except in the 50-99 group. In this group the proprietary expense gain was 86.7 per cent while the voluntary gain was 74.1 per cent. The 100 and over size group of proprietary hospitals was not comparable with the four largest size groups of voluntary hospitals.

Governmental hospitals experienced rather large percentage increases in expenses in all size categories. The dollar amount of increase was not very great in the smaller size groupings although there were sizeable percentage increases in the two smaller sizes -- 53.5 and 104.3 respectively in the under 25 and 25-49 sizes. The largest size, 100 and over, experienced large increases in both dollar amounts and percentages. This information is shown in Table IV-16.

#### Total Expense Per Patient-Day

Probably the most widely used denominator in the hospital field for reducing phenomena to a comparable base is the patient-day. The average daily census is divided into the phenomenon of interest such as total expense in the present case. The result is called (whatever the name of the phenomenon is) per patient-day, e. g., revenue per patient-day.



Although there are many benefits to be derived from having a common base for data, there are some limitations one should be aware of when using the patient-day. Probably the most serious limitation is that not all patient-days really mean the same thing. That is, if one uses total expense per patient-day, as an example, and is comparing such expense for a given class of hospitals such as voluntary hospitals having from 50-99 beds, he would expect any differences in expenses to be the result of say geographic location, or some other variable. However, the real cause of the difference may be that the composition of patient load is different from one hospital to the next. This means essentially, in statistical terms, that there is a non-homogeneous universe which is being reduced to a common base by the use of a simple divisor. Such reduction does not produce a comparable statistic.

Another important limitation is that fluctuations of a seasonal or cyclical nature may be hidden within the patient-day statistic. Thus, if, say, expenses are being considered, it may be that in a given month of the year, the average number of patients treated may be much smaller than during all the other months. For that month, a smaller number of patient-days, then, would be divided into the fixed expenses as well as into the variable. A similar situation could happen for a whole year.

But, in spite of these limitations, patient-day statistics are widely used probably because of the simplicity of computation.

Patient-day expense statistics are available for the period of this study. Table IV-17 shows total expense per patient-day classified

TABLE IV-17.-Total expense per patient-day of all short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent change from 1946<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Total expense per patient-day				
1946	\$ 9.39	\$10.04	\$10.13	\$ 7.39
1947	11.09	11.78	11.83	8.91
1948	13.09	14.06	13.79	10.27
1949	14.33	15.14	14.89	11.96
1950	15.62	16.89	15.32	12.56
1951	16.77	18.01	15.60	13.77
1952	18.35	19.55	17.33	15.37
1953	19.95	21.09	18.75	17.14
1954	21.76	22.78	19.71	19.34
1955	23.12	24.15	21.25	20.62
1956	24.15	24.99	22.27	22.08
1957	26.02	26.81	23.51	24.23
1958	28.27	29.24	26.15	25.82
1959	30.19	31.16	28.28	27.65
1960	32.23	33.23	31.07	29.43
Per cent change from 1946				
1946	0.0	0.0	0.0	0.0
1947	18.1	17.3	16.8	20.6
1948	39.4	40.0	36.1	39.0
1949	52.6	50.8	47.0	61.8
1950	66.3	68.2	51.2	70.0
1951	78.6	79.4	54.0	86.3
1952	95.4	94.7	71.1	108.0
1953	112.5	110.1	85.1	131.9
1954	131.7	126.9	94.6	161.7
1955	146.2	140.5	109.8	179.0
1956	157.2	148.9	119.8	198.8
1957	177.1	167.0	132.1	227.9
1958	201.1	191.2	158.1	249.4
1959	221.5	210.4	179.2	274.2
1960	243.2	231.0	206.7	298.2

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).



according to control. Total expense per patient per day for all non-federal short-term hospitals increased from \$9.39 in 1946 to \$32.23 in 1960. Voluntary patient-day expenses increased from \$10.04 to \$33.23, proprietary expenses from \$10.13 to \$31.07 and governmental from \$7.39 to \$29.43. The percentage changes in these expenses by control were respectively 231.0, 206.7 and 298.2. For all hospitals it was 243.2.

These percentage increases are considerably greater than the increases in costs for items represented in the Consumers' Price Index. The all items index, Table II-11 of chapter two, rose from 83.4 per cent of base in 1946 to 126.5 in 1960. This is an increase of slightly greater than 50 per cent. Total hospital expenses, then, increased almost five times as rapidly as did other consumers' goods and services in general.

Moreover, these expenses increased much more rapidly than did people's aggregate ability to pay for such services. Table II-8, chapter two, shows a percentage increase in net civilian salaries and wages in current dollars of 172.8. This lags somewhat behind the 243.2 per cent increase in hospital expenses. But this really isn't comparable because the wage and salary percentage increase is for an aggregate which is not reduced to a per capita basis as patient-day expense has been.

Perhaps a better comparison of expenses with ability to pay can be obtained by using Table II-9, of chapter two. This table shows that the mean income expressed in current dollars of professional and semi-professional spending units increased 66.8 per cent from 1947 -- the first



year for which information was available. The income of unskilled and service spending units increased 85.8 per cent. Patient-day expense increased in percentage terms much more than either of these measures of income.

The average daily census in the nation's hospitals was shown previously<sup>1</sup> to have increased by 39.9 per cent while population was increasing 26.8 per cent during the years of this study. The author suggested that there may have been an increased ability to purchase hospital care. Such has now been shown not to have been true.<sup>2</sup> Instead there appears only to be an increased willingness to purchase such care.

But even though there seems to have been such willingness, there remains the problem of ability to pay. And, if expenses continue to rise in the future as rapidly as in the period from 1946 to 1960, it would seem that hospital treatment would rather quickly be priced out of the market for the majority of the population. There has been and would probably continue to be increased pressure for some kind of governmental provision of hospital care for these medically indigent people.

---

<sup>1</sup>on page 93.

<sup>2</sup>This conclusion should perhaps be modified somewhat inasmuch as the percentage increase in net civilian wages and salaries may have been available largely for discretionary expenditures. If so, there could have been a percentage increase in ability to purchase hospital care even greater than the percentage increase in total hospital expense per patient-day.

Table IV- G, Appendix IV shows such information as is available regarding patient-day expenses classified according to service categories. One would expect to find expenses greater in the hospitals providing care for the acutely ill or surgical patients than in those hospitals which provide care largely consisting of custodial services. This expectation is based on the fact that more employees are required per patient in the former case than in the latter as has already been shown.<sup>1</sup> Also, additional drugs, supplies and other services are used in the diagnosis and treatment of acute illnesses or surgeries.

Inasmuch as payroll expenses generally are the greatest component in total expenses, constituting more than 50 per cent,<sup>2</sup> it follows that as more employees are required per patient the total cost of care should also increase.

Such is found to be true. For any of the three years for which information is available, total patient-day expense is greater in all special hospitals except psychiatric than in general hospitals. Psychiatric hospitals' expenses per patient-day were less for every year than were expenses of general hospitals.

Classified by size, total expenses per patient-day in small hospitals were lower than in the larger hospitals for the entire period of the study.

---

<sup>1</sup>Table IV-F, Appendix IV. Also see pages 139 and 140 of this chapter.

<sup>2</sup>Tables IV-G, IV-I, IV-K, Appendix IV.

The pattern of expenses of Table IV-18 is just about the same as that shown in Table IV-8 for full-time personnel per 100 patients.

That is, the largest expense per patient-day occurred in the 200-299 and 300-499 size categories. The 200-299 beds hospitals experienced the highest patient-day expense through 1956 and they also had the largest number of employees per 100 patients during these years. From 1957 through 1960 the 300-499 size group had the most employees per 100 patients as well as the highest patient-day expense. The smallest number of employees per 100 patients as well as the lowest patient-day expense generally occurred in the under 25 size group.

Although the patient-day expense pattern was quite similar to the pattern found among personnel per 100 patients, there was a very large difference in the comparative percentage changes from the base years.

During the first seven years of the study, expenses per patient-day increased more than twice as rapidly as personnel per 100 patients in the under 50 beds group of hospitals. But in the 250 and over size group the expense increase was almost eight times as great as the increase in personnel. These increases, of course, are in percentage figures. During the remaining eight years, the percentage increases in expenses per patient-day were somewhat larger than two to slightly less than three times as large as the percentage increases in personnel per 100 patients.

Table IV-19 presents total expense per patient-day of voluntary hospitals classified by size. Generally, throughout the entire period of the study, these expenses were higher in the larger hospitals than in the



TABLE IV-18.-Total expense per patient-day of all short-term general and other special hospitals in the United States, by size, with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total expense per patient-day												
1946	9.39								8.93	8.83	9.59	9.53
1947	11.09								10.59	10.18	11.63	11.07
1948	13.09								11.52	12.13	12.96	13.84
1949	14.33								12.35	13.86	14.38	14.91
1950	15.62								14.90	15.19	16.25	15.43
1951	16.77								14.86	15.65	17.26	17.16
1952	18.35								16.21	17.12	18.93	18.76
1953	19.95	17.22	17.47	18.68	20.14	21.92	20.91	19.01				
1954	21.76	18.27	18.82	19.79	21.72	23.65	23.11	21.39				
1955	23.12	20.98	19.92	20.67	22.83	25.08	24.68	22.93				
1956	24.15	20.50	20.48	21.47	24.67	25.76	25.44	23.99				
1957	26.02	21.95	21.92	23.55	25.74	27.55	27.62	26.69				
1958	28.27	23.89	24.27	25.61	27.84	29.76	30.23	28.82				
1959	29.61	25.51	25.61	27.08	29.79	31.43	32.20	28.27				
1960	32.23	27.03	27.22	29.09	31.48	33.64	34.15	33.67				

TABLE IV-18.-Continued

Per cent change from 1946 and 1953										
1946	0.0							0.0	0.0	0.0
1947	22.7							18.6	15.3	21.3
1948	47.5							29.0	37.4	35.1
1949	57.6							38.3	57.0	49.9
1950	81.5							66.9	72.0	69.4
1951	98.0							66.4	77.2	80.0
1952	120.5							81.4	93.9	97.4
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
1954	9.1	6.1	7.7	5.9	7.8	7.9	10.5			
1955	15.9	21.8	14.0	10.7	13.4	14.4	18.0			
1956	21.1	19.0	17.2	14.9	22.5	17.5	21.7			
1957	30.4	27.5	25.5	26.1	27.8	25.7	32.1			
1958	41.7	38.7	38.9	37.1	38.2	35.8	44.6			
1959	48.4	48.1	46.6	45.0	47.9	43.4	54.0			
1960	61.6	57.0	55.8	55.7	56.3	53.5	63.3			
							77.1			

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

TABLE IV-19.-Total expense per patient-day of voluntary short-term general and other special hospitals in the United States, by size, with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	Total expense per patient-day			
										50- 99	100- 249	250 & over	
1946	10.04								8.24	8.71	9.84	11.15	
1947	11.78								10.13	10.30	11.76	12.76	
1948	14.06								10.92	11.93	13.12	16.55	
1949	15.14								11.35	13.40	14.46	17.35	
1950	16.89								14.61	15.26	16.60	18.16	
1951	18.01								14.78	15.65	17.76	19.70	
1952	19.55								16.04	17.09	19.35	21.20	
1953	21.09	16.68	17.11	18.52	20.52	22.15	21.58	25.26					
1954	22.78	17.42	18.56	19.84	22.12	24.01	23.61	26.45					
1955	24.15	24.34	19.44	20.73	23.29	25.30	24.90	28.59					
1956	24.99	22.36	19.76	21.45	23.89	26.27	25.98	29.59					
1957	26.81	22.32	22.08	23.89	26.20	27.75	27.88	29.72					
1958	29.24	23.60	24.42	26.02	28.37	30.10	30.57	32.46					
1959	31.16	na	na	na	na	na	na	na					
1960	33.23	27.32	27.05	29.26	32.16	34.08	34.80	37.72					



TABLE IV-19.-Continued

Per cent change from 1946 and 1953										
1946	0.0							0.0	0.0	0.0
1947	17.3							22.9	18.3	19.5
1948	40.0							32.5	34.7	33.3
1949	50.8							37.7	53.8	47.0
1950	68.2							77.3	75.2	68.7
1951	79.4									
1952	94.7							79.4	79.7	80.5
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.7	96.2	96.6
1954	8.0	4.4	8.5	7.1	7.8	6.9	9.4			
1955	14.5	45.9	13.6	11.9	13.5	12.7	15.4			
1956	18.5	34.1	15.5	15.8	16.4	18.6	20.4			
1957	27.1	33.8	29.0	29.0	27.7	25.3	29.2			
1958	38.6	41.5	42.7	40.5	38.3	35.9	41.7			
1959	47.7	na	na	na	na	na	na			
1960	57.6	63.8	58.1	58.0	56.7	53.9	61.3			

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.

TABLE IV-20.-Total expense per patient-day of proprietary short-term general and other special hospitals in the United States, by size, with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total expense per patient-day												
1946	10.13								10.03	10.52	9.46	11.92
1947	11.83								11.80	11.00	12.71	12.56
1948	13.79								12.79	13.72	15.86	18.81
1949	14.89								13.37	16.32	16.65	28.01
1950	15.32								14.88	16.00	16.00	16.08
1951	15.60								15.21	17.06	14.82	14.83
1952	17.33								16.62	18.52	17.53	17.01
1953	18.75	17.48	18.61	19.53	19.08 <sup>b</sup>							
1954	19.71	18.54	19.20	20.43	20.42 <sup>b</sup>							
1955	21.25	18.86	21.74	21.93	21.47 <sup>b</sup>							
1956	22.27	18.38	23.63	23.80	21.60 <sup>b</sup>							
1957	23.51	21.68	22.55	24.93	24.09	22.87	0.0	27.32				
1958	26.15	na	na	na	na	na	na	na				
1959	28.28	na	na	na	na	na	na	na				
1960	31.07	26.88	29.89	33.74	31.98	28.07	24.20	32.97				

TABLE IV-20. -Continued

		Per cent change from 1946 and 1953					
		1946					
1946	0.0					0.0	0.0
1947	16.8					17.6	4.6
1948	36.1					27.5	30.4
1949	47.0					33.3	55.1
1950	51.2					48.4	52.1
1951	54.0					51.6	62.2
1952	71.1					65.7	76.0
1953	0.0		0.0	0.0			
1954	5.1		6.1	3.2	4.6		
1955	13.3		7.9	16.8	12.3		
1956	18.8	5.1	27.0	21.9	13.2 <sup>b</sup>		
1957	25.4	24.0	21.2	27.6	26.3	na	na
1958	39.5	na	na	na	na	na	na
1959	50.8	na	na	na	na	na	na
1960	65.7	53.8	60.6	72.8	67.6	na	na

<sup>a</sup> Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup> Refers to the size class 100 and over.

na Not available.



TABLE IV-21.-Total expense per patient-day of state and local governmental short-term general and other special hospitals in the United States, by size, with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 beds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total expense per patient-day												
1946	7.39								8.53	7.87	7.81	7.11
1947	8.91								9.24	9.03	10.25	8.51
1948	10.27								10.45	11.83	10.70	9.93
1949	11.96								12.77	14.13	13.07	11.30
1950	12.56								15.62	14.29	13.72	11.81
1951	13.77								14.45	14.74	14.79	13.27
1952	15.37								15.93	16.38	16.66	14.76
1953	17.14	17.75	17.07	18.51	16.94 <sup>b</sup>							
1954	19.34	19.28	18.93	19.30	19.38 <sup>b</sup>							
1955	20.62	19.60	18.87	19.83	20.88 <sup>b</sup>							
1956	22.08	21.05	19.09	20.42	22.60 <sup>b</sup>							
1957	24.23	21.82	21.01	21.71	23.90	26.84	26.07	24.47				
1958	25.82	na	na	na	na	na	na	na				
1959	27.65	na	na	na	na	na	na	na				
1960	29.43	26.39	25.78	26.24	28.21	31.43	33.74	30.11				

TABLE IV-21.-Continued

Per cent change from 1946 and 1953										
1946	0.0							0.0	0.0	0.0
1947	20.6							8.3	15.4	31.2
1948	39.0							22.5	50.3	37.0
1949	61.8							49.7	79.5	67.3
1950	70.0							83.1	81.6	75.7
1951	86.3							69.4	87.3	89.4
1952	121.5							86.8	108.1	113.3
1953	0.0	0.0	0.0	0.0	0.0					
1954	12.8	8.6	10.9	4.3	14.4 <sup>b</sup>					
1955	20.3	10.4	10.5	7.1	23.3 <sup>b</sup>					
1956	28.8	18.6	11.8	10.3	33.4 <sup>b</sup>					
1957	41.4	22.9	23.1	17.3	41.1	na	na	na	na	na
1958	50.6	na	na	na	na	na	na	na	na	na
1959	61.3	na	na	na	na	na	na	na	na	na
1960	71.7	48.7	51.0	41.8	66.5	na	na	na	na	na

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup>Refers to the size class 100 and over.

na Not available.

TABLE IV-22.-Payroll expense (in thousands of dollars) of all short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent distribution and per cent change from 1946<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Payroll expense				
1946	619,228	431,945	47,066	140,487
1947	774,049	560,608	53,847	159,594
1948	944,007	680,215	58,133	205,659
1949	1,022,307	737,011	60,946	224,350
1950	1,202,722	848,071	72,490	282,161
1951	1,330,906	953,427	69,097	308,382
1952	1,496,954	1,077,838	76,634	342,482
1953	1,704,495	1,218,050	85,490	400,955
1954	1,894,987	1,366,400	81,877	446,710
1955	2,117,000	1,533,000	91,000	494,000
1956	2,302,000	1,670,000	98,000	534,000
1957	2,516,000	1,836,000	102,000	578,000
1958	2,831,000	2,076,000	114,000	642,000
1959	3,162,730	2,330,740	123,940	708,050
1960	3,499,472	2,560,691	143,100	795,681
Per cent distribution				
1946		69.8	7.6	22.7
1947		72.4	7.0	20.6
1948		72.1	6.2	21.8
1949		72.1	6.0	21.9
1950		70.5	6.0	23.4
1951		71.6	5.2	23.1
1952		72.0	5.1	22.8
1953		71.5	5.0	23.5
1954		72.1	4.3	23.6
1955		72.4	4.3	23.3
1956		72.5	4.3	23.2
1957		73.0	4.1	23.0
1958		73.3	4.0	22.7
1959		73.7	3.9	22.4
1960		73.2	4.1	22.7



TABLE IV-22.-Continued

Year	Total	Voluntary	Proprietary	Governmental
Per cent change from 1946				
1946	0.0	0.0	0.0	0.0
1947	25.0	29.9	14.4	13.6
1948	52.5	57.4	23.5	46.4
1949	65.1	70.6	29.5	59.7
1950	94.3	96.3	54.0	100.8
1951	115.0	120.6	46.8	119.5
1952	141.8	149.5	62.8	143.8
1953	175.3	181.9	81.6	185.4
1954	206.1	216.2	74.0	218.0
1955	242.0	254.9	93.6	252.9
1956	271.9	286.6	108.5	281.4
1957	306.5	325.0	117.0	312.9
1958	357.4	380.6	142.6	358.6
1959	411.0	439.6	163.8	405.7
1960	465.3	492.8	204.3	468.6

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

smaller ones. While the increases in actual dollar amounts for the various size categories were roughly comparable, the percentage increases were generally larger in the smaller hospitals.

This same pattern of expenses by size groups for both proprietary and governmental hospitals is evident in Tables IV-20 and IV-21. However, the percentage increases in expenses of these hospitals were usually greater as the sizes increased. This may be explained on the basis of a change in the composition of patient occupancy or a change in the relative efficiency. In the early years of the study, the smaller hospitals in these

control categories had greater patient-day expenses than did the larger hospitals. This would indicate that the large hospitals had less complex cases to care for or that they were more efficient in providing care. Or there may have been some combination of less complex cases and greater efficiency. The greater expenses per patient-day in the larger hospitals toward the end of the study would suggest that the situation had been reversed so that they were treating more complex cases or had become relatively less efficient. Or, again, there may have been some combination of these.

Another point of interest among these three control classes is that patient-day expense is quite consistently smallest in governmental hospitals, largest in voluntary hospitals with proprietary hospitals' expenses in between.

### Payroll Expense

Payroll expense in all short-term hospitals, excluding those operated by the federal government, increased sharply from \$619 million in 1946 to \$3.5 billion in 1960. Usually somewhat over 70 per cent of this expense was incurred in voluntary hospitals and in excess of 20 per cent in governmental hospitals. The remainder, from about 4.0 to 7.0 per cent, was in proprietary hospitals.

The percentage increase for all these hospitals was 465.3. By control groups, the percentage increase amounted to 492.8 per cent in voluntary hospitals and 204.3 and 468.6 per cent respectively in proprietary and governmental hospitals. Table IV-22 shows these data.

When this table is compared with Table IV-12, one finds that payroll expense is the largest single expense item in the total expense aggregate. Moreover, it constitutes a larger element in both voluntary and governmental hospitals than in proprietary hospitals. And, in the two former control groups it is becoming increasingly large. This is shown in the following table.

TABLE IV-23.--Payroll expense as a percentage of total expense

Year	Total	Voluntary	Proprietary	Governmental
1946	53.0	50.9	50.2	61.9
1960	62.3	61.9	52.0	66.1

The increase in payroll expense can probably be explained on the basis of (1) increased number of personnel required per patient which is a reflection of both technological change and greater complexity in the kinds of cases being treated, (2) increase in price levels generally, (3) an increase in wages above the amount which may have resulted from the price level changes and (4) an increase in the number of patients being cared for.

While payroll expenses were increasing 465.3 per cent, the number of employees per patient increased 52.7 per cent, the number of patients treated as shown by the average daily census increased 39.9 per cent and the price level increased 51.7 per cent as measured by the Consumers' Price Index.



The effects<sup>1</sup> of these various influences expressed in thousands of dollars in 1960 and in percentage of total expense were:

Price level increase	\$1,192,635	34.1%
Increase in number of workers per patient	457,477	13.1
Increase in number of patients	248,671	7.1
Improvement in wages	<u>1,600,689</u>	<u>45.7</u>
Total	\$3,499,472	100.0%

Table II-9 of chapter two shows an increase in mean income for professional and semi-professional workers of 66.8 per cent from 1947 to 1960. Unskilled and service workers had an increase of 85.8 per cent. Thus, it appears that hospital employees' wages, increasing 125.8 per cent,<sup>2</sup> changed considerably more than did wages for other occupational groups. The increase of 125.8 per cent is the sum of price level change and the wage improvement change.

Very little information concerning payroll expense classified according to hospital service is available. Such as is available is shown in Appendix IV, Table IV-J. These expenses follow quite closely the pattern exhibited by total expenses. While total expenses of non-federal

---

<sup>1</sup>For computation of these effects, see Table IV-I, Appendix IV.

<sup>2</sup>This percentage increase is computed as follows: The wages paid in 1946 plus the additional wages in terms of 1946 dollars resulting from the increase by 1960 in patients and in number of employees per patient sum to \$1,325 million. Total wages in 1960 in terms of 1946 dollars were \$2,307 million. See Table IV-I, Appendix IV. Thus the difference of \$982 million represents the improvement in wages in 1946 dollars. Dividing \$982 by \$1,325, one obtains a 74.1 per cent improvement to which the price level increase of 51.7 per cent is added for a total of 125.8 per cent.

hospitals were dropping from 92.8 to 88.1 per cent between 1958 and 1960, payroll expense decreased from 90.9 to 85.1 per cent of all payroll expenses of short-term hospitals including those operated by the federal government. Almost all payroll expense was incurred by the general hospital. In 1958, non-federal hospitals excluding general hospitals accounted for 3.8 per cent of all short-term hospital payroll expenses. By 1960, this same group of hospitals incurred only 3.0 per cent of all payroll expenses.

By size classifications, the greatest payroll expenses were incurred in the larger hospitals -- 100 beds and larger. This was true throughout the entire period of time of the study. This is to be expected inasmuch as the majority of beds are contained in these hospitals and also the majority of admissions are to them. Also about 80 per cent of the average daily census of all short-term non-federal hospitals is found in hospitals having 100 or more beds.

Consistent with previously shown growth patterns, payroll expense increased most rapidly in the large size categories. Again, this was true throughout the entire time of the study.

Total payroll expense data by size of hospital are shown in Table IV-24.

In Table IV-25 showing payroll expense of voluntary hospitals by size, the dominance of the larger hospital is even greater than previously shown for the entire field. For example, by 1960 only 13.4 per cent of all payroll expense of voluntary hospitals was incurred in hospitals having



fewer than 100 beds. Likewise, the most rapid growth of total payroll expense both in absolute dollar amounts and percentages occurred in the larger size groups.

Among proprietary hospitals the trend was somewhat different. Inasmuch as there were few very large hospitals in this control group, smaller hospitals were relatively more important. The greatest payroll expenses were incurred in the 50-99 and the 100 and over groups. These groups also experienced the largest percentage increase in payroll expense. See Table IV-26.

Table IV-27 showing payroll expense for governmental hospitals reveals a situation quite similar to that among voluntary hospitals. That is, one in which the largest dollar totals and percentages of expense were incurred in the larger hospitals. However, the most rapid percentage growth in payroll expense took place in the 25-49 beds size group. This was followed closely by the largest size group, 100 beds and over.

One may conclude from the foregoing data that there exists a high positive correlation between payroll expense and total expense.

#### Payroll Expense Per Patient-Day

While total payroll expense increased about 465 per cent, on a patient-day basis this expense increase was 303.2 per cent for the 15 years ending in 1960. The actual dollar amount of increase was from \$4.98 to \$20.08. For voluntary hospitals the increase from \$5.11 to \$20.56 amounted to a percentage increase of 302.2 per cent. For proprietary and governmental hospitals the respective dollar increases were from \$5.09



TABLE IV-24.-Total payroll expense (in millions of dollars) of all short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Payroll expense												
1946	619								50	80	217	272
1947	774								63	100	288	323
1948	944								64	118	331	431
1949	1,022								77	132	366	447
1950	1,203								92	152	415	544
1951	1,331								99	164	459	608
1952	1,497								107	185	522	683
1953	1,704	27	92	206	404	336	318	322				
1954	1,895	29	98	213	438	380	382	355				
1955	2,117	31	105	227	490	434	431	398				
1956	2,302	29	113	250	533	472	469	435				
1957	2,516	31	124	281	556	520	531	473				
1958	2,831	32	140	313	622	578	604	542				
1959	3,181	34	153	347	706	633	705	604				
1960	3,499	36	166	374	725	704	800	695				

## Per cent distribution

1946	8.1	12.9	35.1	43.9
1947	8.1	12.9	37.2	41.7
1948	6.8	12.5	35.1	45.7
1949	7.5	12.9	35.8	43.7
1950	7.6	12.6	34.5	45.2
1951	7.4	12.3	34.5	45.7
1952	7.1	12.4	34.9	45.6

TABLE IV-24.-Continued

1953	1.6	5.4	12.1	23.7	19.7	18.7	18.9
1954	1.5	5.2	11.2	23.1	20.1	20.2	18.7
1955	1.5	5.0	10.7	23.1	20.5	20.4	18.8
1956	1.3	4.9	10.9	23.2	20.5	20.4	18.9
1957	1.2	4.9	11.2	22.1	20.7	21.1	18.8
1958	1.1	4.9	11.1	22.0	20.4	21.3	19.1
1959	1.1	4.8	10.9	22.2	19.9	22.2	19.0
1960	1.0	4.7	10.7	20.7	20.1	22.9	19.9
Per cent change from 1946 and 1953							
1946	0.0					0.0	0.0
1947	25.0					24.7	32.7
1948	52.4					46.8	52.5
1949	65.1					64.6	68.7
1950	94.2					89.2	91.2
1951	114.9					104.7	111.5
1952	141.7					130.0	140.6
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1954	11.2	6.2	7.4	8.4	13.1	20.1	10.2
1955	24.2	15.8	15.0	21.3	29.2	35.5	23.6
1956	35.1	8.5	23.9	21.1	40.5	47.5	35.1
1957	47.7	16.1	35.6	36.2	54.8	67.0	46.9
1958	66.1	19.5	53.4	51.5	72.0	89.9	68.3
1959	86.7	26.6	67.3	67.9	88.4	121.7	87.6
1960	105.3	32.9	81.3	81.1	109.5	151.6	115.8

aTaken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

TABLE IV-25.-Payroll expense (in millions of dollars) of voluntary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Payroll expense												
1946	432								22	55	182	174
1947	561								29	72	242	217
1948	680								30	82	277	292
1949	737								33	93	312	299
1950	848								40	103	356	349
1951	953								44	115	393	402
1952	1,078								49	125	442	462
1953	1,218	9	42	137	328	291	265	145				
1954	1,366	10	48	142	366	327	319	154				
1955	1,533	14	50	154	399	376	361	178				
1956	1,670	13	53	172	413	410	405	205				
1957	1,836	12	64	195	452	445	456	212				
1958	2,076	13	71	216	501	497	519	259				
1959	2,331	na	na	na	na	na	na	na				
1960	2,561	14	81	250	579	604	689	344				
Per cent distribution												
1946									5.2	12.6	42.0	40.2
1947									5.2	12.8	43.1	38.7
1948									4.4	12.1	40.7	42.9
1949									4.5	12.6	42.3	40.6
1950									4.7	12.1	42.0	41.2
1951									4.6	12.1	41.2	42.2
1952									4.5	11.6	41.0	42.9





TABLE IV-26.-Payroll expense (in thousands of dollars) of proprietary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Payroll expense												
1946	47								19	13	12	3
1947	54								24	13	15	2
1948	58								23	14	21	1
1949	61								29	16	15	1
1950	72								32	22	17	1
1951	69								33	20	14	2
1952	77								34	23	17	3
1953	85	12	26	24	22 <sup>b</sup>							
1954	82	13	25	22	21 <sup>b</sup>							
1955	91	12	29	24	25 <sup>b</sup>							
1956	98	11	31	26	30 <sup>b</sup>							
1957	102	12	29	29	24	6	0	1				
1958	114	na	na	na	na	na	na	na				
1959	124	na	na	na	na	na	na	na				
1960	143	13	39	45	35	7	1	2				
Per cent distribution												
1946									40.5	28.4	24.7	6.4
1947									45.1	24.1	27.0	3.8
1948									39.3	24.3	35.3	1.2
1949									47.8	26.1	24.5	1.7
1950									44.6	30.1	23.3	2.1
1951									47.8	29.2	19.7	3.3
1952									44.2	29.4	22.4	3.9





TABLE IV-27.-Payroll expense (in millions of dollars) of state and local governmental short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Payroll expense												
1946	140								9	12	24	96
1947	160								9	15	31	104
1948	206								11	22	34	139
1949	224								14	24	40	147
1950	282								19	27	42	193
1951	308								21	30	53	204
1952	342								24	37	64	218
1953	401	5	23	44	329 <sup>b</sup>							
1954	447	5	25	49	368 <sup>b</sup>							
1955	494	5	26	49	415 <sup>b</sup>							
1956	534	6	29	52	447 <sup>b</sup>							
1957	578	7	32	57	80	69	74	259				
1958	642	na	na	na	na	na	na	na				
1959	708	na	na	na	na	na	na	na				
1960	796	8	46	79	111	93	110	349				
Per cent distribution												
1946									6.4	8.8	16.7	68.0
1947									5.8	9.4	19.7	65.2
1948									5.3	10.8	16.4	67.6
1949									6.4	10.5	17.6	65.5
1950									6.8	9.7	14.9	68.6
1951									6.9	9.6	17.3	66.2
1952									6.9	10.9	18.6	63.7

TABLE IV-27. -Continued

Per cent change from 1946 and 1953									
	1.2	5.7	11.0	82.1 <sup>b</sup>					
1953	1.2	5.7	11.0	82.1 <sup>b</sup>					
1954	1.2	5.6	10.9	82.4 <sup>b</sup>					
1955	1.0	5.2	9.8	83.9 <sup>b</sup>					
1956	1.1	5.4	9.7	83.7 <sup>b</sup>					
1957	1.1	5.5	9.8	13.9	12.0	12.9	44.8		
1958	na	na	na	na	na	na	na		
1959	na	na	na	na	na	na	na		
1960	1.0	5.8	9.9	13.9	11.7	13.8	43.8		
1946	0.0							0.0	0.0
1947	13.6							20.3	33.5
1948	46.4							78.2	43.1
1949	59.7							89.3	68.0
1950	100.8							121.1	79.0
1951	119.5							139.2	126.7
1952	143.8							200.2	170.3
1953	0.0	0.0	0.0	0.0					
1954	11.5	9.5	9.6	11.8 <sup>b</sup>					
1955	23.2	13.7	9.9	26.1 <sup>b</sup>					
1956	33.2	27.6	17.7	36.0 <sup>b</sup>					
1957	44.1	39.8	28.0	46.7 <sup>b</sup>	na	na	na		
1958	60.1	na	na	na	na	na	na		
1959	76.6	na	na	na	na	na	na		
1960	98.5	103.1	78.8	101.3 <sup>b</sup>	na	na	na		

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup>Refers to the size class 100 and over.

naNot available.

TABLE IV-28.-Payroll expense per patient-day of all short-term general and other special hospitals in the United States, 1946-1960, by control with per cent change from 1946<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Payroll expense per patient-day				
1946	4.98	5.11	5.09	4.58
1947	5.99	6.30	5.82	5.14
1948	7.17	7.57	6.74	6.20
1949	7.96	8.37	7.24	7.00
1950	8.86	9.40	7.75	7.80
1951	9.65	10.17	7.74	8.74
1952	10.66	11.22	8.77	9.63
1953	11.86	12.35	9.50	11.10
1954	13.21	13.67	9.99	12.66
1955	14.26	14.76	11.07	13.54
1956	14.85	15.23	11.58	14.46
1957	15.74	16.14	12.00	15.37
1958	17.19	17.71	13.21	16.51
1959	18.76	19.32	14.46	17.97
1960	20.08	20.56	16.18	19.47
Per cent change from 1946				
1946	0.0	0.0	0.0	0.0
1947	20.3	23.3	14.3	12.2
1948	44.0	48.1	32.4	35.4
1949	59.8	63.8	42.2	52.8
1950	77.9	84.0	52.3	70.3
1951	93.8	99.0	52.1	90.8
1952	114.1	119.6	72.3	110.3
1953	138.2	141.7	86.6	142.4
1954	165.3	167.5	96.3	176.4
1955	186.3	188.8	117.5	195.6
1956	198.2	198.0	127.5	215.7
1957	216.1	215.9	135.8	235.6
1958	245.2	246.6	159.5	260.5
1959	276.7	278.1	184.1	292.4
1960	303.2	302.2	217.9	325.1

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).



to \$16.18 and from \$4.58 to \$19.47. These dollar changes represent percentage increases of 217.9 and 325.1 per cent respectively.

It would appear from these data that the nature of care provided by governmental hospitals and proprietary hospitals changed substantially when compared with voluntary hospitals. In 1946, the payroll expense per patient-day was practically identical in voluntary and proprietary hospitals. This would indicate, all other things remaining constant, that the patient load distribution and hence the type of care were almost identical in these hospitals. Governmental hospitals apparently provided a less complex type of care. And, this care was probably somewhat more custodial in nature.

By 1960, the situation had changed so that the governmental and voluntary hospitals were providing care almost identical in nature. However, the patient-day payroll expense of proprietary hospitals, being considerably less than that of either voluntary or governmental hospitals, would indicate that the patients of proprietary hospitals require less complicated care than patients of other short-term hospitals. See Table IV-28.

Although showing figures for only four years, 1957-1960, Table IV-K, Appendix IV, reveals that patient-day payroll expense was highest in hospitals providing care for acute illness or surgery. This table also shows payroll expenses per patient-day for all hospitals including the short-term hospitals which are the primary topic of this study. For all hospitals, this expense is only slightly more than half the comparable expense of short-term hospitals. For instance, in 1960, payroll expense per patient-day was \$20.19 for all short-term hospitals including those operated by the federal

government. For all hospitals, the expense was \$10.92. Thus, it is evident that patient-day payroll expense for long-term hospitals is even lower. One may conclude only what is common knowledge -- that the care provided by long-term hospitals is largely of a custodial nature.

By observing the patient-day payroll expenses grouped into size classifications, one may see in Table IV-29 that generally the largest patient-day payroll expense appeared in the larger hospitals. This was true throughout the entire period of the study. It was also generally true that the largest increases from 1946 to 1960 occurred in the larger size categories.

In voluntary hospitals, the highest patient-day payroll expense was found in the largest hospitals. In fact the smallest size group incurred the lowest expense for each year of the study. Then, each larger size group had a progressively larger expense. During the first half of the time period, the percentage increase in this expense was greatest in the larger hospitals. But, during the second half, the greatest increases in this type of expense occurred in the smaller hospitals. This information is presented in Table IV-30.

As with total expenses, payroll expenses per patient-day in proprietary hospitals were largest in the medium sized hospital. Contrary to the pattern manifested by both voluntary and governmental hospitals, proprietary hospitals had some of the lowest patient-day expenses in the largest sized hospitals. This was true during the years 1950-1952 and also became even more evident in 1956, 1957 and 1960.

TABLE IV-29.-Total payroll expense per patient-day of all short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Payroll expense per patient-day												
1946	4.98								4.40	4.49	4.99	5.26
1947	5.99								5.19	5.26	6.25	6.21
1948	7.17								5.46	6.34	7.21	7.77
1949	7.96								6.26	7.45	8.07	8.42
1950	8.86								7.66	8.19	9.10	9.13
1951	9.65								7.60	8.61	9.71	10.39
1952	10.66								8.38	9.44	10.87	11.37
1953	11.86	8.71	9.40	10.57	11.79	12.97	12.50	12.47				
1954	13.21	9.51	10.25	11.36	12.87	14.33	14.39	14.21				
1955	14.26	11.12	10.98	11.98	13.92	15.46	15.51	15.27				
1956	14.85	10.45	11.32	12.42	14.97	15.84	15.95	15.97				
1957	15.74	11.40	11.99	13.61	15.32	16.70	17.10	17.09				
1958	17.19	12.35	13.20	14.74	16.77	18.28	18.77	18.47				
1959	18.40	13.31	14.04	15.82	18.34	19.71	20.70	18.37				
1960	20.08	15.20	15.30	16.95	19.29	20.95	21.75	22.35				





TABLE IV-30.--Payroll expense per patient-day of voluntary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Payroll expense per patient-day												
1946	5.11								4.10	4.40	5.01	5.70
1947	6.30								5.08	5.36	6.26	6.99
1948	7.57								5.41	6.29	7.15	8.93
1949	8.37								6.01	7.36	8.11	9.51
1950	9.40								7.67	8.13	9.28	10.28
1951	10.17								7.62	8.65	9.99	11.36
1952	11.22								8.52	9.38	11.09	12.43
1953	12.35	8.92	9.25	10.47	11.98	13.05	12.69	15.62				
1954	13.67	9.54	10.22	11.42	13.16	14.48	14.49	16.52				
1955	14.76	13.73	10.88	12.07	14.20	15.58	15.46	18.10				
1956	15.23	12.27	11.01	12.47	14.53	16.13	16.08	18.65				
1957	16.14	12.02	12.42	13.91	15.64	16.78	17.14	18.31				
1958	17.71	12.89	13.65	15.19	17.17	18.43	18.71	20.09				
1959	19.32	na	na	na	na	na	na	na				
1960	20.56	15.56	15.59	17.27	19.90	21.12	21.79	23.73				

TABLE IV-30.-Continued

		Per cent change from 1946 and 1953									
		1946	0.0								
1947	23.3								0.0	0.0	0.0
1948	48.1								23.9	21.8	25.0
1949	63.8								32.0	43.0	42.7
1950	83.9								46.6	67.3	61.9
									87.1	84.8	85.2
1951	99.0								85.9	96.6	99.4
1952	119.6								107.8	113.2	121.4
1953	0.0		0.0	0.0	0.0	0.0	0.0	0.0			
1954	10.7		7.0	10.5	9.1	9.8	11.0	14.2			
1955	19.5		53.9	17.6	15.3	18.5	19.4	21.8			
1956	23.3		37.6	19.0	19.1	21.3	23.6	26.7			
1957	30.7		34.8	34.3	32.9	30.6	28.6	35.1			
1958	43.4		44.5	47.6	45.1	43.3	41.2	47.4			
1959	56.4		na	na	na	na	na	na			
1960	66.5		74.4	68.5	64.9	66.1	61.8	71.7			

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

naNot available.



TABLE IV-31.-Payroll expense per patient-day of proprietary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Payroll expense per patient-day												
1946	5.09								4.69	5.21	5.39	6.58
1947	5.82								5.48	5.51	6.75	6.70
1948	6.74								5.38	6.03	10.40	10.03
1949	7.24								6.34	7.76	8.83	12.41
1950	7.75								7.27	8.50	8.19	7.49
1951	7.74											
1952	8.77								7.44	8.65	7.39	7.29
1953	9.50	7.97	9.22	10.24	10.12 <sup>b</sup>				8.01	9.77	9.17	9.28
1954	9.99	9.06	9.79	10.43	10.43 <sup>b</sup>							
1955	11.07	9.17	11.17	11.74	11.48 <sup>b</sup>							
1956	11.58	8.43	12.11	12.70	11.69 <sup>b</sup>							
1957	12.00	10.51	11.29	13.23	12.51	12.05	0.0	10.28				
1958	13.21	na	na	na	na	na	na	na				
1959	14.46	na	na	na	na	na	na	na				
1960	16.17	14.43	15.55	17.57	16.45	14.61	13.27	17.14				

TABLE IV-31.-Continued

		Per cent change from 1946 and 1953							
1946	0.0								
1947	14.3							0.0	0.0
1948	32.4							16.8	5.8
1949	42.2							14.7	15.7
1950	52.3							35.2	48.9
								55.0	63.1
1951	52.1								
1952	72.3							58.6	66.0
1953	0.0	0.0	0.0	0.0	0.0			70.8	87.5
1954	5.2	13.7	6.2	1.9	3.1 <sup>b</sup>				
1955	16.5	15.1	21.1	14.6	13.4 <sup>b</sup>				
1956	21.9	5.8	31.3	24.0	15.5 <sup>b</sup>				
1957	26.3	31.9	22.5	29.2	23.6 <sup>b</sup>	na	na	na	na
1958	39.1	na	na	na	na	na	na	na	na
1959	52.2	na	na	na	na	na	na	na	na
1960	70.2	81.1	68.7	71.6	62.5 <sup>b</sup>	na	na	na	na

<sup>a</sup> Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup> Refers to the size class 100 and over.

na Not available.

TABLE IV-32.-Payroll expense per patient-day of state and local governmental short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Payroll expense per patient-day												
1946	4.58								4.60	4.20	4.72	4.59
1947	5.14								4.84	4.65	5.96	5.04
1948	6.23								5.76	6.74	6.46	6.10
1949	7.00								6.72	7.61	7.53	6.81
1950	7.80								8.37	8.19	8.16	7.63
1951	8.74								7.79	8.42	8.66	8.92
1952	9.63								8.65	9.45	10.04	9.66
1953	11.10	9.84	9.91	10.98	11.22 <sup>b</sup>							
1954	12.66	10.76	10.84	11.64	12.99 <sup>b</sup>							
1955	13.54	10.89	10.96	11.82	14.03 <sup>b</sup>							
1956	14.46	11.83	11.09	12.13	15.14 <sup>b</sup>							
1957	15.37	12.09	11.82	12.86	14.65	16.72	16.85	16.27				
1958	16.51	na	na	na	na	na	na	na				
1959	17.97	na	na	na	na	na	na	na				
1960	19.47	15.75	14.89	15.72	17.45	20.54	24.22	21.17				





Except during the years 1958 and 1960, the patient-day payroll expense differences between the medium sized and larger hospitals were only a few cents. In these two years, the differences were as large as three or four dollars in some instances. For example, in 1960, \$17.57 was the expense of 50-99 beds hospitals while hospitals having 300-499 beds had expenses of only \$13.27. See Table IV-31 for proprietary hospitals' payroll expense per patient-day.

This change in pattern upon initial inspection seems significant. But Table III-4, number of proprietary hospitals, shows that in 1960 there were 161 hospitals in the 50-99 size while there was only one in the 300-499 group. Also, in 1958 there was only one hospital in the 500 and over group. Thus, one is unable to infer that such a reversal of expense patterns would be characteristic of all proprietary hospitals as they increase in size.

Table IV-32 reveals that the pattern of patient-day payroll expenses in governmental hospitals was quite generally the same as that exhibited by voluntary hospitals. The highest expenses were found among the larger hospitals. But the most rapid percentage growth in expenses occurred in the smaller hospitals.

### Revenue

Although this study is not concerned with either the amount or sources of revenue obtained by hospitals, such information is of vital interest to those who administer hospitals or may be involved in policy formulation for them. Information showing total revenue from all sources and revenue

from patients was available for voluntary and proprietary hospitals.

Such information both in total dollar amounts and in dollars per patient-day is shown in Tables IV-L through IV-U of Appendix IV.

A quick comparison of Table IV-2 of this chapter with Table IV-Q of Appendix IV reveals that the entire expense of running proprietary hospitals, and almost the entire expense incurred in running voluntary hospitals, is paid for from patient revenues. In 1946, expenses of voluntary hospitals were \$848,093,000 while patient revenue was \$739,408,000. By 1960 these totals had increased to \$4,139,430,000 and \$3,925,200,000 respectively. Proprietary hospitals expenses in 1946 were \$93,657,000 with patient revenue of \$98,687,000. In 1960 these totals were respectively \$274,793,000 and \$286,394,000.

### Assets

Data concerning assets were available in two general classifications -- plant assets and total assets. Of primary interest for the purposes of this study are the plant asset figures. These will be considered first.

#### Plant Assets<sup>1</sup>

As indicated by Table IV-33, plant assets of all short-term non-federal hospitals increased sharply for the 15 years ending in 1960 from \$2.3

---

<sup>1</sup>Plant assets include land, buildings, equipment and funded reserves for construction and improvements according to the instructions included in the American Hospital Association's questionnaire for the Annual Survey of Hospitals Accepted for Registration, 1963. See Appendix IV, Table IV-V.



billion to \$8.3 billion -- a percentage increase of 255.9 per cent. In all control classifications, there were sizeable increases both in dollar amounts and in percentage terms. The largest percentage increase was 289 per cent shown by voluntary hospitals while the smallest was the 56.3 per cent increase for proprietary hospitals. The investment for plant assets by governmental hospitals was increased by an amount equal to 212.1 per cent.

While the number of patients cared for during the years of this study was increasing, requiring an increased number of hospitals and beds, the dollar amount of investment in assets increased far greater in percentage terms than did the number of hospitals, beds or patients treated. Of course, there was an increase in the wholesale price index for both construction materials and all commodities. However, the increase in this index is less than 100 per cent for these years. One may reasonably infer, then, that there was some net increase in the amount or complexity or both of the physical plant required to care for patients. At least, this would seem reasonable to the extent that such increase is represented by dollar value of investment.

The data available by service are shown in Appendix IV, Table IV-W. In general they reveal the now familiar pattern of greater increases

in short-term than in long-term hospitals. Also, among the short-term hospitals, the greatest increase occurred in those hospitals caring for the surgical or acutely ill medical patient.

By sizes, all categories except the smallest showed substantial percentage growth. The greatest percentage increases occurred in the 200-299 and 300-499 groups. Also, the greatest increase occurred in the latter half of the period. As one would expect, the investment in the larger hospitals formed a large portion of total plant investment in all hospitals. Notice in Table IV-34 that the percentage distribution shows relatively decreasing percentages in all categories except the 200-299 and 300-499. Of these decreases, the largest was in the 100-199 size. Investment in plant assets by all hospitals smaller than 200 beds declined from 44.2 per cent of total plant investment in 1946 to 38.9 per cent in 1960.

While the actual dollar amounts and the per cent distribution figures were different, there was relatively the same concentration of investment in the four size categories in 1946 for all short-term hospitals and for voluntary hospitals. The growth pattern was slightly different, however. In voluntary hospitals through 1952, the fastest growth occurred in the under 50 beds size, followed next by the 50-99 group. For all hospitals during the same time, the fastest growth was in the under 50 beds group but second fastest growing was the 100-249 group. The growth in amount of plant assets left their distribution among the various size categories practically unchanged. For all hospitals and for voluntary hospitals the

bulk of investment was in the hospitals having 100 or more beds. But in each instance a slight net increase had been made in the smaller hospitals. These changes may be observed in Tables IV-34 and IV-35.

From 1953 through 1960 the most rapid growth in plant assets of voluntary hospitals occurred in those hospitals having 100 or more beds. By 1960 the largest concentration of assets was in the 300-499 size group instead of the 100-199 group which had the largest amount in 1953. Generally, there was a change such that the amount of plant assets was increasingly concentrated in the larger hospitals toward the latter years of this study.

Among proprietary hospitals, the largest concentration of plant assets was found in the smaller size categories. This was true throughout the entire time of the study. However, during the latter years of the study, there appeared to be somewhat of a movement of resources to larger size hospitals. For example, in Table IV-36, the per cent distribution shows that about 54 per cent of all proprietary hospitals' plant assets were found in hospitals having less than 50 beds during the years 1946 through 1952. But by 1960, this percentage was down to about 43 per cent. During this same period, 1953-1960, investment in the 50-99 beds category increased so that by 1960 almost 30 per cent of proprietary assets were possessed by these hospitals as contrasted with only slightly above 20 per cent in 1946.

Also the per cent change portion of Table IV-36 shows that the greatest percentage growth in plant assets of proprietary hospitals occurred in the



50-99 and 100 and over size hospitals. These growth percentages were respectively 145.3 and 133.4, more than twice as great as the percentage growth of any other category.

Plant assets of governmental hospitals were greatest in the larger hospitals throughout the entire period 1946-1960. However, there was some relative increase in the investment in smaller hospitals -- those under 50 beds. This increase, at least in the later years of the study, was primarily in the 25-49 beds size. The plant assets of governmental hospitals having fewer than 50 beds were 4.9 per cent of all governmental hospital plant assets in 1946. By 1960 this percentage had increased to 9.8 -- although it appears that a peak had been reached in 1956 when the percentage was 11.4. The largest percentage change in investment in any category was the 220.6 per cent increase in the under 50 size from 1946 through 1952. For the second half of the period, the largest change was in the 100 and over size. See Table IV-37 for data concerning plant assets of governmental hospitals.

Inasmuch as numerous technological and demographic changes occurred in the United States from 1946 to 1960, it would be worthwhile to determine whether the hospital "industry" incorporated these changes in its characteristics. It has already been determined that the number of hospitals and the number of hospital beds increased somewhat more rapidly than did population.

A crude, yet useful, measure of technological change can be obtained by equating capital accumulation with the value of technological innovation.

This obviously is not very accurate because of two important limitations. First, there may be a rather lengthy time lag before innovations are widely adopted and are included in capital expenditures of firms. Second, there may be sizeable contra effects of depreciation. That is, if a given amount of investment, say  $n$  dollars, is made in innovated assets, and  $k$  dollars are recorded as depreciation of existing assets,  $n-k$  dollars will be the amount of accretion to total net assets. Thus, the effect of technological change, as measured by assets, is diminished to some extent. Conversely, if new assets of an identical nature are acquired to replace old ones, the dollar value of such acquisitions may be interpreted as representing innovation when in fact there is no such technological change.

Inasmuch as there is no series available showing total cumulative investment in the American economy, total plant assets of hospitals cannot be compared directly with total plant assets of the economy. However, there is information available by which the yearly net private domestic fixed investment can be determined. This is shown in column 7 of Table II-13.

Plant assets of hospitals can be transformed very simply to make them comparable with the figures of Table II-13. This transformation is effected merely by subtracting from each year's plant assets figure the preceding year's assets. For example, in Table IV-33 total plant assets for 1950 are shown as \$2,782,000,000 while the assets for 1946 were \$2,330,000,000. The difference is \$452,000,000. Tables IV-38 through IV-42 are derived in this manner. They show the annual net plant asset

changes throughout the period of this study. The per cent change sections of these tables may be compared directly with the per cent change figures of Table II-13, column 8.

Taking 1950 as the base year, one readily sees that there was less investment in the economy during seven of the following ten years than in 1950. Assume that whatever was happening to capital accumulation in the economy in general should be quite analogous to whatever was happening to investment in plant assets in the hospital "industry." One would expect the same pattern of investment in hospitals as in the economy. However, hospitals' plant assets investment was larger in six of the ten years than in 1950 and smaller in four years. Thus, for the ten-year-period, there appears to have been greater relative net investment in hospital plant assets than the net investment in the economy.

Although the largest dollar amount of the investment in plant assets was made by voluntary hospitals, there were substantial dollar amounts made by governmental hospitals and by far the largest percentage increases were made by them. These data are shown in Table IV-38.

Judging by these per cent change figures, it appears that voluntary hospitals did not keep pace with the economy from 1951 through 1953, and in 1956. However, in 1954, 1955 and 1957 through 1960, it surpassed the general economy in technological innovation. This statement and the following inferences are made subject to the limitations and assumptions previously stated. Proprietary and governmental hospitals also exceeded



TABLE IV-33.-Plant assets (in thousands of dollars) of short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent distribution and per cent change from 1946<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Plant assets				
1946	2,330,208	1,588,311	128,166	613,731
1947	na	na	na	na
1948	na	na	na	na
1949	na	na	na	na
1950	2,782,315	2,042,622	111,170	628,523
1951	3,107,516	2,231,437	114,490	761,589
1952	3,620,789	2,560,424	119,621	940,744
1953	4,110,742	2,912,361	112,372	1,086,009
1954	4,565,904	3,274,283	116,234	1,175,387
1955	5,188,143	3,665,388	118,985	1,403,770
1956	5,434,704	3,951,017	117,572	1,366,115
1957	6,681,345	4,645,990	229,142	1,806,213
1958	7,084,584	5,148,493	181,445	1,754,646
1959	8,000,724	5,896,500	186,035	1,918,189
1960	8,292,286	6,176,664	200,086	1,915,536
Per cent distribution				
1946		68.2	5.5	26.4
1947		na	na	na
1948		na	na	na
1949		na	na	na
1950		73.4	4.0	22.6
1951		71.8	3.7	24.5
1952		70.7	3.3	26.0
1953		70.8	2.7	26.4
1954		71.7	2.5	25.7
1955		70.6	2.3	27.1
1956		72.7	2.2	25.1
1957		69.5	3.4	27.0
1958		72.7	2.6	24.8
1959		73.7	2.3	24.0
1960		74.5	2.4	23.1

TABLE IV-33.-Continued

Year	Total	Voluntary	Proprietary	Governmental
Per cent change from 1946				
1946	0.0	0.0	0.0	0.0
1947	na	na	na	na
1948	na	na	na	na
1949	na	na	na	na
1950	19.4	28.7	-13.3	2.4
1951	33.4	40.5	-10.9	24.1
1952	55.4	61.2	-6.2	53.3
1953	76.4	83.4	-12.5	76.9
1954	96.0	106.2	-9.4	91.4
1955	122.7	130.8	-7.0	128.7
1956	133.3	148.8	-7.8	122.5
1957	186.7	192.6	78.9	194.1
1958	204.1	224.2	41.4	185.8
1959	243.4	271.3	45.3	212.4
1960	255.9	289.0	56.3	212.1

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.

TABLE IV-34.-Plant assets (in millions of dollars) of short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Plant assets												
1946	2,330								176	299	739	1,117
1947	na								na	na	na	na
1948	na								na	na	na	na
1949	na								na	na	na	na
1950	2,782								223	341	879	1,339
1951	3,108								260	404	1,036	1,408
1952	3,621								303	461	1,161	1,696
1953	4,111	84	260	521	955	744	741	805				
1954	4,566	82	283	564	1,069	859	875	835				
1955	5,188	81	323	655	1,192	963	997	977				
1956	5,435	69	339	693	1,248	1,009	1,044	1,033				
1957	6,681	109	397	762	1,440	1,274	1,323	1,375				
1958	7,085	99	408	816	1,540	1,378	1,456	1,388				
1959	8,086	106	448	934	1,788	1,519	1,699	1,592				
1960	8,292	98	460	955	1,716	1,621	1,925	1,518				
Per cent distribution												
1946						7.6	12.8	31.7	47.9			
1947						na	na	na	na			
1948						na	na	na	na			
1949						na	na	na	na			
1950						8.0	12.3	31.6	48.1			
1951						8.4	13.0	33.3	45.3			
1952						8.4	12.7	32.1	46.8			





TABLE IV-35.-Plant assets (in millions of dollars) of voluntary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953a

Year	Total	Under 25 bds					Plant assets					Per cent distribution		
		25 bds	25-49	50-99	100-199	200-299	300-499	500 & over	Under 50 bds	50-99	100-249	250 & over		
1946	1,588								77	182	635	695		
1947	na								na	na	na	na		
1948	na								na	na	na	na		
1949	na								na	na	na	na		
1950	2,043								99	231	759	953		
1951	2,231								112	277	868	974		
1952	2,560								141	306	983	1,130		
1953	2,912	31	125	346	783	644	635	349						
1954	3,274	33	137	357	897	725	739	386						
1955	3,665	33	145	406	983	809	829	460						
1956	3,951	27	161	452	1,001	872	913	524						
1957	4,646	44	198	521	1,160	1,071	1,104	548						
1958	5,148	44	217	561	1,253	1,183	1,225	665						
1959	5,896	na	na	na	na	na	na	na						
1960	6,177	45	239	650	1,375	1,395	1,658	814						
1946					4.8	11.5	39.9	43.7						
1947					na	na	na	na						
1948					na	na	na	na						
1949					na	na	na	na						
1950					4.8	11.3	37.2	46.7						
1951					5.0	12.4	38.9	43.6						
1952					5.5	12.0	38.4	44.1						





TABLE IV-36.-Plant assets (in millions of dollars) of proprietary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Plant assets												
1946	128								69	26	26	6
1947	na								na	na	na	na
1948	na								na	na	na	na
1949	na								na	na	na	na
1950	111								60	27	23	1
1951	114								60	30	19	6
1952	120								65	24	24	8
1953	112	28	37	24	23 <sup>b</sup>							
1954	116	25	37	34	21 <sup>b</sup>							
1955	119	26	45	26	22 <sup>b</sup>							
1956	118	20	44	25	28 <sup>b</sup>							
1957	229	38	71	54	51	11	0	4				
1958	181	na	na	na	na	na	na	na				
1959	186	na	na	na	na	na	na	na				
1960	200	25	61	59	42	9	2	3				
Per cent distribution												
1946									54.1	20.3	20.6	5.0
1947									na	na	na	na
1948									na	na	na	na
1949									na	na	na	na
1950									54.2	24.2	20.5	1.1
1951									52.6	25.9	16.5	5.0
1952									54.1	19.7	19.9	6.4

TABLE IV-36. -Continued

Per cent change from 1946 and 1953										
1953	24.6	33.1	21.5	20.9 <sup>b</sup>						
1954	21.1	32.1	29.1	17.7 <sup>b</sup>						
1955	21.9	37.8	21.7	18.6 <sup>b</sup>						
1956	17.0	37.7	21.6	23.7 <sup>b</sup>						
1957	16.6	31.1	23.5	22.4	4.8	0.0	1.7			
1958	na	na	na	na	na	na	na			
1959	na	na	na	na	na	na	na			
1960	12.6	30.5	29.6	21.0	4.3	0.8	1.3			
1946	0.0							0.0	0.0	0.0
1947	na							na	na	na
1948	na							na	na	na
1949	na							na	na	na
1950	-13.3							-13.1	-13.7	-81.4
1951	-10.7							-13.1	-28.5	-10.7
1952	-6.7							-6.6	-10.1	19.9
1953	0.0	0.0	0.0	0.0						
1954	3.4	-10.9	40.3	-12.4 <sup>b</sup>						
1955	5.9	-5.5	7.1	-5.6 <sup>b</sup>						
1956	4.6	-27.5	5.3	18.8 <sup>b</sup>						
1957	103.9	37.7	122.9	181.8 <sup>b</sup>	na	na	na			
1958	61.5	na	na	na	na	na	na			
1959	65.6	na	na	na	na	na	na			
1960	78.1	-8.9	145.3	133.4 <sup>b</sup>	na	na	na			

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup>Refers to the size class 100 and over.

na Not available.

TABLE IV-37.-Plant assets (in millions of dollars) of state and local governmental short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Plant assets												
1946	614								30	90	78	415
1947	na								na	na	na	na
1948	na								na	na	na	na
1949	na								na	na	na	na
1950	629								64	83	97	385
1951	762								87	97	148	429
1952	941								97	131	154	559
1953	1,086	24	93	154	815 <sup>b</sup>							
1954	1,175	25	108	173	869 <sup>b</sup>							
1955	1,404	21	134	223	1,026 <sup>b</sup>							
1956	1,366	22	133	215	995 <sup>b</sup>							
1957	1,806	28	128	187	229	193	219	822				
1958	1,755	na	na	na	na	na	na	na				
1959	1,918	na	na	na	na	na	na	na				
1960	1,916	27	160	246	298	218	265	701				
Per cent distribution												
1946									4.9	14.7	12.6	67.7
1947									na	na	na	na
1948									na	na	na	na
1949									na	na	na	na
1950									10.2	13.2	15.4	61.3
1951									11.4	12.7	19.5	56.4
1952									10.3	13.9	16.4	59.4





TABLE IV-38.-Net investment in plant assets (in thousands of dollars) of short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent change from 1950

Year	Total	Voluntary	Proprietary	Governmental
Net investment				
1946	0	0	0	0
1947	na	na	na	na
1948	na	na	na	na
1949	na	na	na	na
1950	452,107	454,311	-16,996	14,792
1951	325,201	188,815	3,320	133,066
1952	513,273	328,987	5,131	179,155
1953	489,953	351,937	-7,249	145,265
1954	455,162	361,922	3,862	89,378
1955	622,239	391,105	2,751	228,383
1956	246,561	285,629	-1,413	-37,655
1957	1,246,641	694,973	111,570	440,098
1958	403,239	502,503	-47,697	-51,567
1959	916,140	748,007	4,590	163,543
1960	291,562	280,164	14,051	-2,653
Per cent change from 1950				
1950	0	0	0	0
1951	-28.1	-58.4	-119.5	799.6
1952	13.5	-27.6	-130.2	1,111.2
1953	8.4	-22.5	-57.4	882.1
1954	0.7	-20.3	-122.7	504.2
1955	37.6	-13.9	-116.2	1,443.9
1956	-45.5	-37.1	-91.7	-354.6
1957	175.7	53.0	-756.4	2,875.2
1958	-10.8	10.6	180.6	-448.6
1959	102.6	64.6	-127.0	1,005.6
1960	-35.5	-38.3	-182.7	-117.9

na Not available.

the economy in rate of innovation for almost every year of the period under consideration.

Table IV-X, Appendix IV, contains the limited amount of information available concerning changes in investment in plant assets classified according to hospital service.

Rather substantial dollar amounts were consistently invested in the 100-199, 200-299 and 300-499 size categories. In fact, more than half of all investment in hospital plant assets was made in these size groups each year from 1954 on.

Table II-13 shows that investment in the total economy fluctuated widely varying from plus 16.1 per cent to minus 80.6 per cent of the base year amount. Thus the amplitude of investment in the economy was 96.7 per cent of investment in 1950.

Investment in hospitals was much more volatile. For all short-term non-federal hospitals the investment amplitude between 1953 and 1960 was 227.7 per cent. By size categories, this amplitude percentage varied from a low of 173.8 for 300-499 beds hospitals to a high of 2935.3 for hospitals having fewer than 25 beds. The 500 and over size group had an amplitude of 1408.7 per cent. If these extremes of size are excluded, the fluctuation, while still sizeable for all the other categories, remains between 173.8 per cent of base year for the 300-499 group and 230.2 for the 50-99 group. See Table IV-39.

No pattern appears to be evident in the fluctuation cited for all short-term non-federal hospitals or for any of the size categories of these



hospitals. That is, there were no apparent trends. Moreover, the fluctuation bore no similarity to that which occurred in the economy generally.

One may conclude, then, that innovation in the economy is a highly irregular process. In the hospital field, the process becomes even more erratic.

Tables IV-40 through IV-42 show the changes in plant assets by control and size of hospital. Although there are some differences shown by these categorizations, essentially the same conclusion emerges as that which has already been reached. Thus, for any short-term non-federal hospital regardless of size or control, innovation as measured by investment is highly erratic and seemingly follows no pattern.

#### Total Assets

Total assets, Table IV-43, of all short-term non-federal hospitals show quite the same general pattern that has been previously observed by examination of plant assets. This should be expected inasmuch as plant assets constitute about 80 per cent of total assets. From about \$3.4 billions in 1947, total assets grew to approximately \$10.9 billions in 1960, an increase of 215.7 per cent.

By control, assets were largely concentrated in voluntary hospitals which possessed an amount usually greater than three-fourths of total assets of all control groups. About 20 per cent of total assets were owned by governmental hospitals while the remaining 2.0 to 4.0 per cent were owned by proprietary hospitals. When the percentage distribution of total

assets is compared with percentage distribution of plant assets, one sees that voluntary hospitals own a larger percentage of total assets than of plant assets. This probably is explained by the fact that voluntary hospitals own endowment funds and public subscription monies which may not be possessed by either proprietary or governmental hospitals.

Percentage increase was greatest in the governmental category amounting to 258.3 per cent. It was least for proprietary hospitals amounting only to 88.4 per cent. Voluntary hospitals had an increase of 212.3 per cent.

Appendix IV, Table IV-Y shows the distribution of total assets by service for the years 1958-1960. The pattern for total assets is generally the same as that observed for plant assets although data were not available for a long enough time to enable one to draw any inferences with a high degree of confidence.

Table IV-Z, Appendix IV, is an index of the amounts of total assets. This table shows a rather steady increase in the amounts of total assets for all control groups as was shown in Table IV-41. Indeed, Table IV-Z merely presents the same information in a somewhat different form.

Table IV-44 shows the distribution of total assets by size. Tables IV-45 through IV-47 show this same information further classified by control as well as size. The patterns of their distribution and rate of growth are essentially the same as those shown in the corresponding classifications of plant assets.

TABLE IV-39.-Net investment in plant assets (in millions of dollars) of short-term general and other special hospitals in the United States, 1950-1960 by size, with per cent change from 1950 and 1954

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Net investment												
1950	452								46	42	140	223
1951	428								37	63	157	69
1952	513								43	57	126	287
1953	na								na	na	na	na
1954	455	-2	23	42	114	115	133	29				
1955	622	-2	40	92	123	105	122	142				
1956	247	-11	16	37	57	46	47	56				
1957	1,247	40	58	69	192	266	279	342				
1958	403	-11	10	53	100	104	133	14				
1959	1,002	7	40	119	238	141	243	203				
1960	206	-9	12	21	-73	102	226	-74				
Per cent change from 1950 and 1954												
1950									0.0	0.0	0.0	0.0
1951									-20.7	48.1	11.5	-69.0
1952									-6.9	35.0	-10.6	28.9
1953												
1954	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
1955	36.7	-12.0	71.5	116.2	8.2	-8.3	-8.5	383.3				
1956	-45.8	530.4	-33.8	-11.9	-50.2	-60.2	-64.5	89.1				
1957	173.9	-2,404.9	148.9	63.9	69.1	132.3	109.3	1,058.7				
1958	-11.4	504.5	-55.3	26.0	-12.4	-9.2	-0.7	-52.7				
1959	120.0	-514.1	72.2	180.1	109.5	23.3	82.0	588.5				
1960	-54.7	387.9	-50.5	-50.1	-163.9	-11.1	69.6	-350.0				

naNot available.



TABLE IV-40.-Net investment in plant assets (in millions of dollars) of voluntary short-term general and other special hospitals in the United States, 1950-1960, by size, with per cent change from 1950 and 1954.

Year	Total	Net investment											
		Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over	
1950	454								22	49	125	259	
1951	189								14	46	109	20	
1952	329								29	29	115	156	
1953	0	0	0	0	0	0	0	0					
1954	362	2	13	11	114	82	104	36					
1955	391	1	7	49	86	84	90	74					
1956	286	6	17	45	17	63	85	64					
1957	695	17	37	69	159	198	191	24					
1958	503	1	19	40	94	112	120	117					
1959	748	na	na	na	na	na	na	na					
1960	280	1	21	89	122	212	434	149					
Per cent change from 1950 and 1954													
1950	0								0	0	0	0	
1951	-58.4								-37.2	-6.6	-12.8	-92.6	
1952	-27.6								32.5	-40.9	-7.9	-39.6	
1953													
1954	0	0	0	0	0	0	0	0					
1955	8.1	-72.9	-43.2	362.6	-24.4	2.7	-14.0	103.7					
1956	-21.1	-407.3	31.4	320.9	-84.8	-22.8	-18.7	77.2					
1957	92.0	711.7	190.8	546.4	39.0	143.2	83.1	-33.7					
1958	38.8	-72.8	49.5	276.5	-18.2	37.3	15.6	221.2					
1959	106.7	na	na	na	na	na	na	na					
1960	-22.6	-58.6	67.8	733.6	6.8	160.1	316.0	310.1					

naNot available.

TABLE IV-41.-Net investment in plant assets (in millions of dollars) of proprietary short-term general and other special hospitals in the United States, 1950-1960, by size, with per cent change from 1950 and 1954

Year	Net investment										Per cent change from 1950 and 1954			
	Total	Under 25 bds	25-49	50-99	100-199	200-299	300-499	500 & over	Under 50 bds	50-99	100-249	250 & over		
1950	-17								-9	1	-4	-5		
1951	3								-b	3	-4	4		
1952	5								4	-5	5	2		
1953	na	na	na	na	na									
1954	4	-3	b	10	-3a									
1955	3	1	8	-8	2a									
1956	-1	-6	1	-b	6a									
1957	112	18	27	28	23	11	0	4						
1958	-48	na	na	na	na	na	na	na						
1959	5	na	na	na	na	na	na	na						
1960	14	-13	10	5	-9	-2	2	-1						
1950	0.0								0.0	0.0	0.0	0.0		
1951	-119.5								-99.8	223.6	8.1	-186.9		
1952	-130.2								-149.6	-823.4	-234.3	-137.6		
1953	na													
1954	0.0													
1955	-28.8	-149.8	12,690.0	-182.4	-154.4a									
1956	-136.6	101.6	-1,181.7	-104.4	-306.3a									
1957	2,788.9	-697.7	44,906.6	191.9	-906.0a		na	na	na	na	na	na		
1958	-1,335.0	na	na	na	na		na	na	na	na	na	na		
1959	18.9	na	na	na	na		na	na	na	na	na	na		
1960	263.8	327.5	17,150.0	-44.4	220.0a		na	na	na	na	na	na		

aRefers to the size class 100 and over.

bLess than one.

naNot available.

TABLE IV-42.-Net investment in plant assets (in millions of dollars) of state and local governmental short-term general and other special hospitals in the United States, 1950-1960, by size, with per cent change from 1950 and 1954

Year	Total	Net investment										
		Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
1950	15								34	-8	19	-30
1951	133								23	14	52	44
1952	179								10	34	6	129
1953	na											
1954	89	1	15	19	54 <sup>a</sup>							
1955	228	-4	25	50	157 <sup>a</sup>							
1956	-38	1	-1	-8	-30 <sup>a</sup>							
1957	440	6	-6	-28	-766	193	219	822				
1958	-52	na	na	na	na	na	na	na				
1959	164	na	na	na	na	na	na	na				
1960	-3	-b	32	58	69	25	46	-121				
Per cent change from 1950 and 1954												
1950	0								0	0	0	0
1951	799.6								-31.2	-284.9	169.2	-245.1
1952	1,111.2								-70.9	-550.0	-70.1	-524.8
1953	na											
1954	0.0	0.0	0.0	0.0	0.0							
1955	155.5	-507.4	66.1	160.6	189.8 <sup>a</sup>							
1956	-142.1	-9.1	-103.5	-140.4	-155.8 <sup>a</sup>							
1957	392.4	536.4	-136.8	-245.7	-1,517.9 <sup>a</sup>							
1958	-157.7	na	na	na	na							
1959	83.0	na	na	na	na							
1960	-103.0	-57.4	112.2	204.1	27.3 <sup>a</sup>							

<sup>a</sup>Refers to the size class 100 and over.

<sup>b</sup>Less than one.

naNot available.



TABLE IV-43.-Total assets (in thousands of dollars) of short-term general and other special hospitals in the United States, 1946-1960, by control, with per cent distribution and per cent change from 1947<sup>a</sup>

Year	Total	Voluntary	Proprietary	Governmental
Total assets				
1946	0	0	0	0
1947	3,438,629	2,697,385	129,119	612,125
1948	3,698,983	2,888,844	135,533	674,606
1949	3,934,260	3,100,691	131,167	702,402
1950	4,348,577	3,349,744	137,890	860,943
1951	4,518,493	3,459,520	140,677	918,296
1952	5,138,422	3,901,342	147,226	1,089,854
1953	5,738,840	4,348,486	144,786	1,245,568
1954	6,177,448	4,709,316	144,709	1,323,423
1955	6,985,000	5,223,000	148,000	1,614,000
1956	7,535,000	5,741,000	173,000	1,621,000
1957	8,805,000	6,505,000	300,000	1,990,000
1958	9,419,000	7,221,000	219,000	1,980,000
1959	10,154,485	7,807,091	226,262	2,121,132
1960	10,858,067	8,422,222	242,542	2,193,303
Per cent distribution				
1946		0.0	0.0	0.0
1947		78.4	3.8	17.8
1948		78.1	3.7	18.2
1949		78.8	3.3	17.8
1950		77.0	3.2	19.8
1951		76.6	3.1	20.3
1952		75.9	2.9	21.2
1953		75.8	2.5	21.7
1954		76.2	2.3	21.4
1955		74.8	2.1	23.1
1956		76.2	2.3	21.5
1957		73.9	3.4	22.6
1958		76.7	2.3	21.0
1959		76.9	2.2	20.9
1960		77.6	2.2	20.2

TABLE IV-43.-Continued

Year	Total	Voluntary	Proprietary	Governmental
Per cent change from 1947				
1946				
1947	0.0	0.0	0.0	0.0
1948	1.2	7.1	5.4	10.3
1949	14.4	15.0	1.6	14.7
1950	26.5	24.2	7.0	40.7
1951	31.4	28.3	9.3	50.0
1952	49.4	44.6	14.0	78.1
1953	66.9	61.2	12.4	103.6
1954	79.6	74.6	12.4	116.2
1955	103.1	93.7	14.7	163.7
1956	119.1	112.9	34.1	164.9
1957	156.0	141.2	132.6	225.2
1958	173.9	167.7	69.8	223.5
1959	195.3	189.5	75.2	246.6
1960	215.7	212.3	88.4	258.3

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

TABLE IV-44.-Total assets (in millions of dollars) of short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1947 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total assets												
1946	na								na	na	na	na
1947	3,439								173	376	1,092	1,797
1948	3,699								215	433	1,142	1,910
1949	3,934								246	499	1,289	1,901
1950	4,349								313	548	1,422	2,066
1951	4,518								na	na	na	na
1952	5,138								376	602	1,647	2,514
1953	5,820	167	326	688	1,294	1,035	1,075	1,235				
1954	6,177	93	346	717	1,438	1,152	1,229	1,201				
1955	6,985	95	393	833	1,591	1,293	1,370	1,409				
1956	7,535	98	422	906	1,716	1,395	1,478	1,520				
1957	8,805	139	488	995	1,905	1,718	1,792	1,769				
1958	9,419	167	572	1,115	2,012	1,804	1,908	1,842				
1959	10,243	153	607	1,165	2,233	1,923	2,135	2,028				
1960	10,858	118	566	1,201	2,202	2,153	2,498	2,119				
Per cent distribution												
1946									na	na	na	na
1947									5.0	10.9	31.8	52.3
1948									5.8	11.7	30.9	51.6
1949									6.3	12.7	32.8	48.3
1950									7.2	12.6	32.7	47.5
1951									na	na	na	na
1952									7.3	11.7	32.1	48.9





TABLE IV-45.-Total assets (in millions of dollars) of voluntary short-term general and other special hospitals in the United States, 1947-1960, by size, with per cent distribution and per cent change from 1947 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total assets												
1946	na								na	na	na	na
1947	2,697								89	261	970	1,377
1948	2,889								109	313	999	1,468
1949	3,101								121	371	1,151	1,458
1950	3,350								157	407	1,254	1,532
1951	3,460								151	405	1,283	1,620
1952	3,901								190	421	1,433	1,857
1953	4,378	37	167	489	1,104	927	935	719				
1954	4,709	38	179	483	1,237	1,002	1,065	705				
1955	5,223	42	186	553	1,347	1,120	1,183	792				
1956	5,741	40	201	623	1,404	1,229	1,338	905				
1957	6,505	57	253	702	1,573	1,482	1,556	881				
1958	7,221	96	337	815	1,678	1,578	1,659	1,057				
1959	7,807	na	na	na	na	na	na	na				
1960	8,422	57	310	845	1,812	1,887	2,198	1,313				
Per cent distribution												
1946									na	na	na	na
1947									3.3	9.7	36.0	51.1
1948									3.8	10.8	34.6	50.8
1949									3.9	12.0	37.1	47.0
1950									4.7	12.1	37.4	45.7
1951									4.4	11.7	37.1	46.8
1952									4.9	10.8	36.7	47.6

TABLE IV-45.-Continued

1953	0.8	3.8	11.2	25.2	21.2	21.4	16.4
1954	0.8	3.8	10.3	26.3	21.3	22.6	15.0
1955	0.8	3.6	10.6	25.8	21.4	22.6	15.2
1956	0.7	3.5	10.9	24.5	21.4	23.3	15.8
1957	0.9	3.9	10.8	24.2	22.8	23.9	13.5
1958	1.3	4.7	11.3	23.2	21.9	23.0	14.6
1959	na	na	na	na	na	na	na
1960	0.7	3.7	10.0	21.5	22.4	26.1	15.6

Per cent change from 1947 and 1953							
1946	na						
1947	0.0					na	na
1948	7.1					0.0	0.0
1949	15.0					22.5	19.9
1950	24.2					36.0	42.1
1951	28.3					76.4	55.9
1952	44.6					69.7	55.2
1953	0.0	0.0				113.5	61.3
1954	7.6	3.6	0.0	0.0	0.0		47.7
1955	19.3	13.2	-1.2	12.0	8.1	0.0	0.0
1956	31.1	18.5	13.1	22.0	20.8	13.9	-1.9
1957	48.6	55.1	27.4	27.2	32.6	26.5	10.2
1958	64.9	160.8	43.6	42.5	59.9	43.1	25.9
1959	78.3	na	66.7	52.0	70.2	66.4	22.5
1960	92.4	59.5	72.8	64.1	103.6	77.4	47.0
			na	na	na	na	na
			85.6	72.8	135.1	82.6	

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.



TABLE IV-46.--Total assets (in millions of dollars) of proprietary short-term general and other special hospitals in the United States, 1947-1960, by size, with per cent distribution and per cent change from 1947 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total assets												
1946	na								na	na	na	na
1947	129								55	32	37	5
1948	136								64	35	35	1
1949	131								76	29	25	1
1950	138								71	34	32	1
1951	141								71	38	26	6
1952	147								77	33	30	8
1953	148	33	48	35	32 <sup>b</sup>							
1954	145	27	47	42	28 <sup>b</sup>							
1955	148	31	50	36	31 <sup>b</sup>							
1956	173	33	58	42	39 <sup>b</sup>							
1957	300	50	89	74	67	15	0	1				
1958	219	na	na	na	na	na	na	na				
1959	226	na	na	na	na	na	na	na				
1960	243	30	73	72	51	10	2	3				
Per cent distribution												
1946									na	na	na	na
1947									42.6	24.8	28.7	3.9
1948									46.9	26.2	26.1	0.8
1949									58.0	22.1	19.1	0.8
1950									51.4	24.6	23.2	0.7
1951									50.4	27.0	18.4	4.3
1952									52.0	22.5	20.3	5.2

TABLE IV-46.-Continued

	1953	1954	1955	1956	1957	1958	1959	1960	Per cent change from 1947 and 1953				
	22.3	32.4	23.6	21.6 <sup>b</sup>									
	19.0	32.8	28.9	19.3 <sup>b</sup>									
	20.9	33.8	24.3	20.9 <sup>b</sup>									
	19.4	33.8	24.0	22.8 <sup>b</sup>									
	16.7	29.7	24.6	22.3	4.9	0.0	1.9						
	na	na	na	na	na	na	na						
	na	na	na	na	na	na	na						
	12.3	30.3	29.9	21.1	4.3	0.9	1.3						
	na												
	0.0												
	5.0												
	1.6												
	6.8												
	9.0												
	14.0												
	0.0	0.0	0.0	0.0									
	-2.4	-16.5	-1.6	17.7	-11.5 <sup>b</sup>								
	-0.1	-5.9	4.1	0.8	-1.3 <sup>b</sup>								
	16.6	1.8	21.1	17.1	24.4 <sup>b</sup>								
	102.6	52.6	84.7	107.9	176.1	na	na	na					
	47.7	na	na	na	na	na	na	na					
	52.6	na	na	na	na	na	na	na					
	63.6	-9.0	52.1	104.1	111.2	na	na	na					
	na												
	0.0												
	15.1												
	38.1												
	28.6												
	27.8												
	38.7												
	na	0.0	0.0	0.0									
	11.0	11.0	-4.5										
	-10.1	-32.5											
	6.6	-14.6											
	19.9	-29.5											
	3.8	-19.4											
	na												
	0.0												
	-76.7												
	-76.3												
	-75.5												
	15.3												
	55.5												

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup>Refers to the size class 100 and over.

naNot available.

TABLE IV-47.-Total assets (in millions of dollars) of state and local governmental short-term general and other special hospitals in the United States, 1947-1960, by size, with per cent distribution and per cent change from 1947 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total assets												
1946	na								na	na	na	na
1947	612								29	83	85	415
1948	675								42	84	108	441
1949	702								49	99	113	441
1950	861								85	107	137	532
1951	918								100	113	172	534
1952	1,090								110	147	183	650
1953	1,294	96	108	181								
1954	1,323	28	120	193								
1955	1,614	23	157	244								
1956	1,621	24	161	244								
1957	1,999	31	146	219		265	221	235				
1958	1,980	na	na	na	na	na	na	na				
1959	2,121	na	na	na	na	na	na	na				
1960	2,193	32	183	284	338	255	298	803				
Per cent distribution												
1946									na	na	na	na
1947									4.7	13.6	13.8	67.8
1948									6.2	12.5	16.0	65.3
1949									7.0	14.1	16.1	62.8
1950									9.9	12.4	15.9	61.8
1951									10.8	12.3	18.8	58.1
1952									10.1	13.5	16.8	59.6



TABLE IV-47. -Continued

[illegible]

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961 )

<sup>b</sup>Refers to the size class 100 and over.

na Not available.

### Summary

Reaffirming the patterns first introduced in chapter three, the data of this chapter have shown that the large, voluntary hospital has increasingly, during the years of this study, assumed a position of pre-eminence among the nation's hospitals.

The number of full-time personnel employed in all short-term non-federal hospitals more than doubled with the greatest growth occurring in the larger voluntary and governmental hospitals. By 1960, about 73 per cent of these personnel were employed by voluntary hospitals. Increasingly complex cases seemed to have been treated inasmuch as the number of employees required per 100 patients increased about 50 per cent in each control category. The large voluntary hospital, 500 beds and over, employed the greatest number, 245 employees per 100 patients in 1960.

In the aggregate, total hospital expenses increased from \$1.2 billion in 1946 to \$5.6 billion in 1960. Nearly three-fourths of the total each year was incurred by voluntary hospitals. The largest amount of total expense incurred by hospitals classified on the basis of size and control originated in the larger voluntary hospitals. On a patient-day basis, the expense of caring for a patient each day increased most in the larger hospitals; the highest cost, occurring in 1960, was \$37.72 in voluntary hospitals having 500 beds or more. Well over half of the total expense was comprised of payroll expense. Average wages for the hospital employee increased from about 50 per cent to 100 per cent more than the average for other workers in the nation.

By 1960, plant assets for all hospitals had increased 256 per cent to \$8.2 billion. Over 75 per cent of these plant assets were owned by voluntary hospitals. And, as one would expect, investment in these assets was concentrated in the larger size classifications. Net investment in the hospital "industry" increased more rapidly than investment in the economy generally. Total assets for all hospitals increased to the sum of \$10.8 billion. The percentage of total assets owned by voluntary hospitals was even greater than the percentage of plant assets.

Governmental hospitals displayed evidence of vigorous growth similar to that shown by voluntary hospitals. However, proprietary hospitals revealed a mixed pattern of some growth accompanied by considerable decrease in some attributes.

Although there was some evidence of a mixed pattern of growth by size class, generally the larger sizes grew most rapidly to positions of increased dominance in the "industry." Of the seven size categories, the smallest possessed only about 1.0 per cent of industry assets and accounted for about the same percentage of business.



## CHAPTER V

### Demand for Hospital Care

One of the purposes of this study was stated to be to "derive a statistical demand function for hospital care. (a) Determine, if possible, how and why it shifted, if it did shift." The problem of determining demand is dealt with in this chapter. First, linear demand curves are fitted to expense data to determine the shift in demand. Then, a multiple linear regression demand function is computed. Finally, the demand function is recomputed for data adjusted for price level changes.

### Simple Linear Demand

Demand is defined as "a schedule of the quantities of an economic good which buyers would be willing to purchase at a corresponding schedule of prices in a given market at a given time."<sup>1</sup> For this study, the market is the entire United States. The "given time" is the period from 1946 through 1960. The schedules of quantities and prices are the actual prices prevailing and quantities of hospital care purchased in each of the years of the study.

---

<sup>1</sup>Ralph H. Blodgett, Our Expanding Economy (New York: Rinehart and Company, Inc., 1955), p. 252.

As E. J. Working<sup>1</sup> has pointed out, statistical data show only a point of intersection of a demand curve and a supply curve for each observation in the set of data available. Thus, the regression curve fitted to the points may assume the shape of a supply curve or a demand curve or neither. Identification of the curve is required. Unfortunately, there is no precise way to make such identification. Customarily, some assumption is made about the elasticity and relative variability of the assumed demand and supply curves. If the supply curve is the more variable, the scatter of points will yield a regression curve which may be thought to be a typical demand curve. A typical supply curve is obtained if demand shifts more than supply.

It seems reasonable to assume that supply shifts more than demand with respect to hospital care inasmuch as such care is so important that it may be obtained largely on non-price bases and may be paid for by some agency other than the individual receiving the care. Thus, demand may be expected to be inelastic and to shift little -- the shifts coming largely from population changes. While supply may respond to population changes, it is subject also to price changes in factors as well as to the changes in costs resulting from innovation. Hence, supply, being subject to more causes of shifts than demand, may shift by larger amounts than demand. There may be some positive correlation in the shifts of demand and supply if both responses to population changes have about the same time lag.

---

<sup>1</sup>E. J. Working, "What Do Statistical 'Demand Curves' Show?" The Quarterly Journal of Economics Vol. 41, (1927), pp. 212f. quoted in George J. Stigler and Kenneth Boulding, Readings in Price Theory (Homewood, Illinois: Richard D. Irwin, Inc., 1952), pp. 97f.

Adjustments to the data and approximate methods are used in order to eliminate changes through time and arrive at the static conditions required for the analysis of demand. Demand curves were obtained by the following method.<sup>1</sup> First, the market, the United States, is given and causes no difficulty in the analysis. Second, changes, over time, did occur in population, the price level, per cent of population protected by hospital insurance and median income of the population. Adjustments for these changes were made by expressing price as the ratio, patient-day expense/median income (per cent of population protected by hospital insurance). Quantity, as adjusted, is expressed in the ratio patient-days/100 population. No adjustment was necessary for price level change inasmuch as it would appear in both the numerator and denominator of the price ratio and would cancel out:

$$\frac{\frac{\text{Pt-day expense}}{\text{Price index}}}{\frac{\text{Insurance (Median income)}}{\text{Price index}}} = \frac{\text{Pt-day expense}}{\text{Insurance (Median income)}}$$

Finally, regression lines were fitted to these adjusted points by the method of "least squares."

Table V-1 shows the adjustments necessary to obtain the information which is plotted in the scatter diagrams, Figures V-1 and V-2.

Figure V-1 shows the scatter of points representing the coordinates of price and quantity for the years of this study. It is possible that the points

---

<sup>1</sup>Milton H. Spencer and Louis Siegelman, Managerial Economics (Revised edition; Homewood, Illinois: Richard D. Irwin, Inc., 1964), pp. 126ff.



TABLE V-1.-Adjustments for demand curves

Year	PD Exp. (1)	% Pop. Having Hosp. Ins. (2)	Med. Inc. all Sp. Units (3)	PD Exp./Med. Income (4)	(Ins.) (Med. Inc.) (5)
1947	\$11.09	36.7	2530	.00438	92851.0
1948	13.09	41.8	2840	.00461	118712.0
1949	14.33	44.6	2700	.00531	120420.0
1950	15.62	50.8	3000	.00521	152400.0
1951	16.77	56.3	3200	.00524	180160.0
1952	18.35	59.1	3430	.00535	202713.0
1953	19.95	62.1	3780	.00528	234738.0
1954	21.76	63.6	3700	.00588	235320.0
1955	23.12	66.1	3960	.00584	261756.0
1956	24.15	69.8	4250	.00568	296650.0
1957	26.02	71.8	4350	.00598	312330.0
1958	28.27	71.4	4400	.00643	314160.0
1959	30.19	73.0	4880	.00619	356240.0
1960	32.23	74.1	5100	.00632	377910.0

PD Exp/ (Ins.) (Med.Inc.) (6)	Population (000's omit) (7)	Admissions (000's omit) (8)	Adm./ 100 Pop. (9)	Average Length of Stay (10)	Patient- days (col.8x10) (11)	PD/ 100 Pop. (12)
.000119	144126	15908	11.04	8.0	127264.0	88.30
.000110	146631	15072	10.28	8.7	131126.4	89.43
.000119	149188	15428	10.34	8.3	128052.4	85.83
.000102	151683	16663	10.99	8.1	134970.3	88.98
.000093	154360	16677	10.80	8.3	138419.1	89.67
.000091	157028	17413	11.09	8.1	141045.3	89.82
.000085	159636	18098	11.34	7.9	142974.2	89.56
.000092	162417	18392	11.32	7.8	143457.6	88.33
.000088	165270	19100	11.56	7.8	148980.0	90.14
.000081	168176	20107	11.96	7.7	154823.9	92.06
.000083	171198	21002	12.27	7.6	159615.2	93.23
.000090	174054	21684	12.46	7.6	164798.4	94.68
.000085	177103	21605	12.20	7.8	168519.0	95.15
.000085	179323	22970	12.81	7.6	174572.0	97.35

represent a segment of a quadratic curve. Computation of the equation by the method of least squares yields the result,  $Y = 5675.422000 - 119.058160X + 0.633626X^2$ . The graph of the equation is shown as  $Y_3$  in Figure V-I. If one measures goodness of fit by the sum of squares of deviations from the regression line reduced to a comparable base, the quadratic curve yields a better fit than two linear curves. An inspection of the graphs leads one to suspect as much. Numerical measures of the differences may be computed from the totals shown in Table V-2.

TABLE V-2.-Sums of squares of deviations from regression lines

Regression lines	Sums of squares	Sums of squares per degree of freedom
$Y_1$ (1947-1955)	691.09	98.73
$Y_2$ (1951-1960)	116.08	14.51
$Y_3$ (1947-1960)	724.39	72.44
$Y_4$ (1947-1952)	324.52	81.13
$Y_5$ (1953-1960)	83.10	13.85

When the data are grouped for the years 1947-1952 and 1953-1960, the following respective linear equations may be computed:

$$Y_4 = 661.59 - 6.2695X \text{ and } Y_5 = 121.23 - 0.3793X.$$

In general, the relationships between these curves are the same as those between curves  $Y_1$  and  $Y_2$  shown in Figure V-I. However, the intersection between curves  $Y_4$  and  $Y_5$ , at which point their elasticities could be compared, requires a greater extrapolation of  $Y_4$  than is required of  $Y_1$  in order to obtain



the intersection of  $Y_1$  and  $Y_2$ . Thus, in order to minimize extrapolation beyond the data and because the years 1951 through 1955 appear to have been pivotal years for the shift which occurred, they are included in the computation of each of the demand curves,  $Y_1$  and  $Y_2$ .

As the graph shows, the curve for the earlier period,  $Y_1$ , is more negatively sloped than is the curve for the latter period,  $Y_2$ . Also, its corrected standard error of estimate is larger being  $9.9361 \times 10^{-6}$  while it is  $3.8092 \times 10^{-6}$  for the latter period. This lack of precision in fit for the first curve results primarily from the sizeable deviations of the values for the four years -- 1947, 1948, 1953, 1954. However, the "co-variation" of price and quantity is larger in the early period. The coefficients of determination are respectively .503 and .227 for the data of the first and second curves.

Coefficients of elasticity could be computed for equations  $Y_1$  and  $Y_2$  and comparisons be made of their magnitudes at a point of intersection. However, in view of the weak identification of demand such comparison has little meaning. The linear curves imply that demand shifted and became more elastic in the later years than it had been in the early years. But the good quadratic fit suggests that there may have been shifts along the demand curve. There is the suggestion also of some shift of the quadratic curve itself. Thus, demand seems to have increased although little can be said about the magnitude of the increase.

This shift seemingly centers on the changing percentage of population having hospital insurance coverage. Observe in Table V-1, column 4, that when patient-day expense is adjusted for income changes, there is still an increase in "price" between the beginning and the end of the period. When further adjustment is made, column 6, for insurance coverage, a decline occurs between the beginning and the end of the period.

The foregoing remarks refer to price and quantity when quantity is measured by the ratio patient-days/100 population. Patient-days are included in this ratio inasmuch as they constitute a commonly used measure in hospital statistics. However, it can be argued that admissions may be a more appropriate measure to use for quantity of hospital care. Consequently, demand curves have been computed using the ratio admissions/100 population as the quantity variable. The price variable is unchanged. The graph of these curves is presented as Figure V-2.

Although the equations of these curves and their related statistics differ from their counterparts in Figure V-1, the general results are essentially similar confirming the previous findings. Table V-3 summarizes the findings shown in both graphs.

In order to compute the statistical demand curves, the assumption was implicitly made that no changes occurred in the economy other than price and quantity. If no other changes did occur, one would expect that

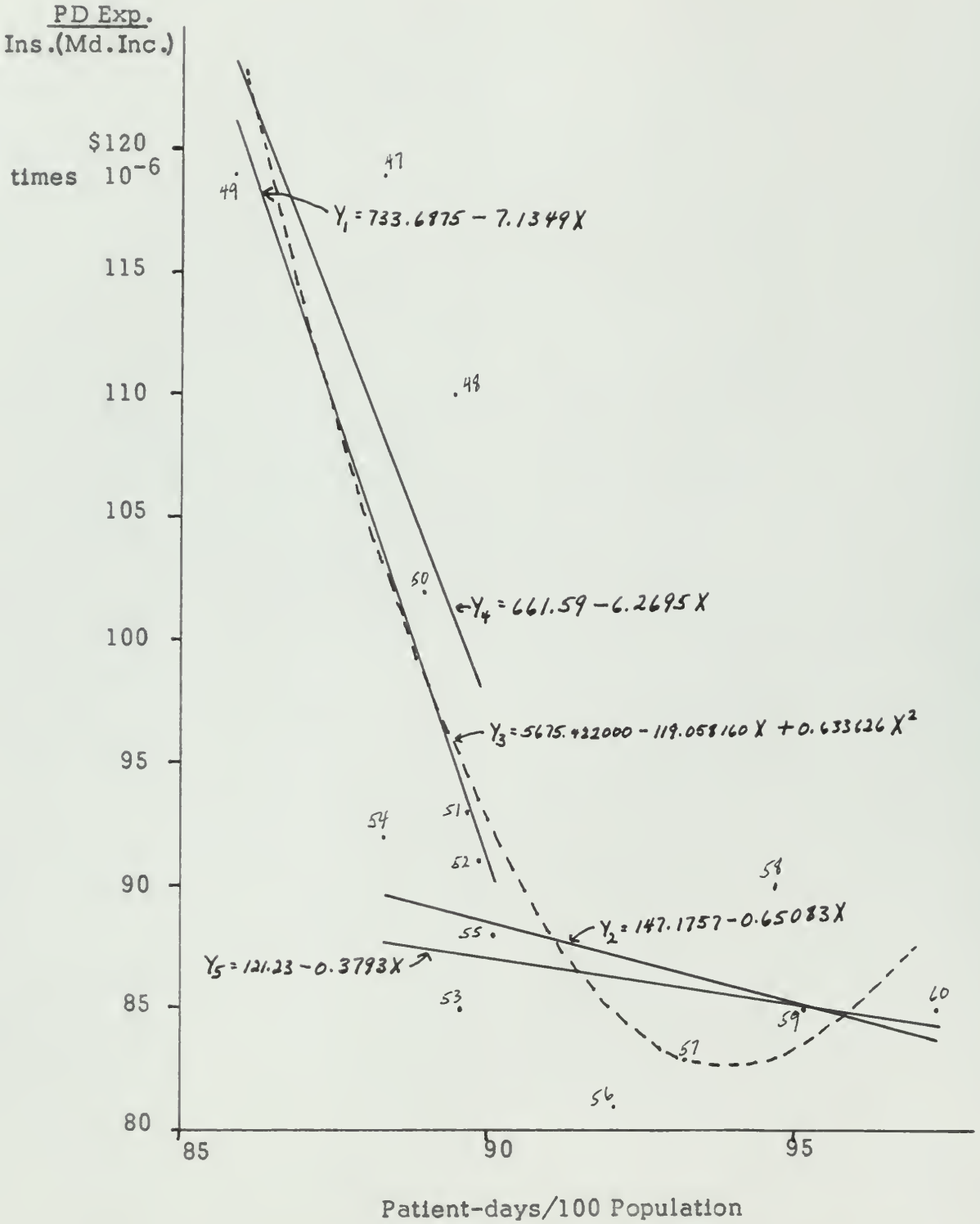


Figure V-1.-Demand for Hospital Care, 1946-1960



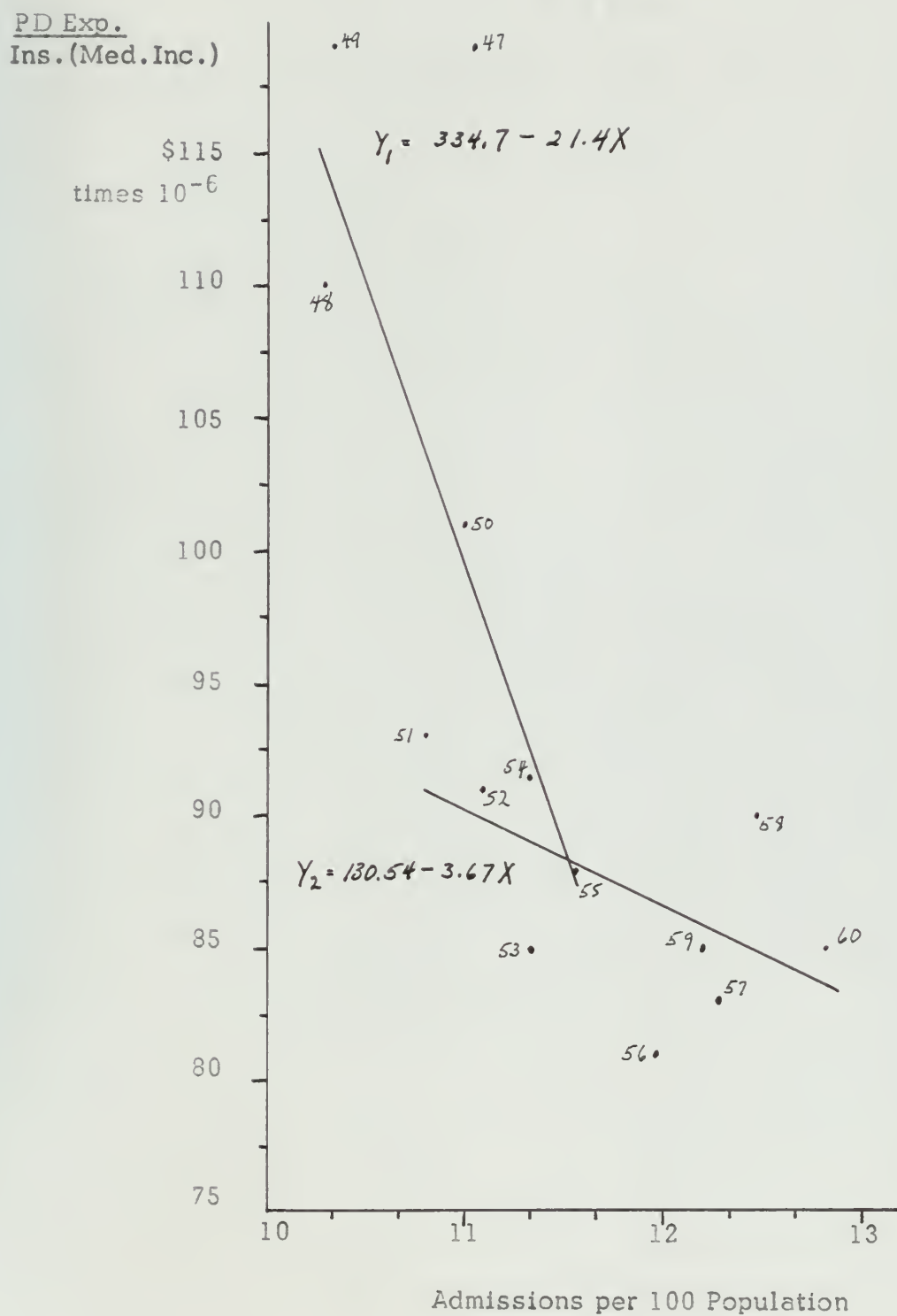


Figure V-2.-Demand for Hospital Care,  
1946-1960

TABLE V-3.--Summary of hospital demand statistics

Item	Figure V-1		Figure V-2	
	1947-55	1951-60	1947-55	1951-60
Equation <sup>1</sup> $y =$	$733.6875 - 7.1349X$	$147.1757 - 0.65083X$	$334.7-21.4X$	$130.54-3.67X$
$\bar{S}_{y.x}^1$	9.9361	3.8092	9.8891	3.5003
$r$	-.709	-.476	-.712	-.589
$r^2$	.503	.227	.507	.347

<sup>1</sup>The figures shown are coded. To convert to original terms, multiply by  $10^{-6}$ .

as price/median income changed patient-days/100 population would change in the opposite direction. However, a comparison of columns four and nine or four and twelve in Table V-1 reveals that changes in these ratios were in the same directions.

Among the factors considered in this study, the only one remaining to account for changes in the ratios is hospital insurance coverage. Hence, one infers that the shifts in the demand curve for hospital care may have been caused primarily by changes in the proportion of the population covered by hospital insurance.

Disregarding all other changes, one may be interested in the relationship between income changes and changes in expenditures for hospital care. The relationship may be summarized by the income elasticity of demand.

Total hospital expenditures surrogate for hospital expenditures per spending unit inasmuch as no series exists for the latter. Total expenditures are plotted against median income per spending unit on a double logarithmic scale in Figure V-3. A free-hand regression line fitted to the points has a slope of approximately 1.5. Thus, the coefficient of income elasticity is about 1.5.

But in order to allow for other factors which may affect expenditures, a least squares multiple regression consumption function was computed.

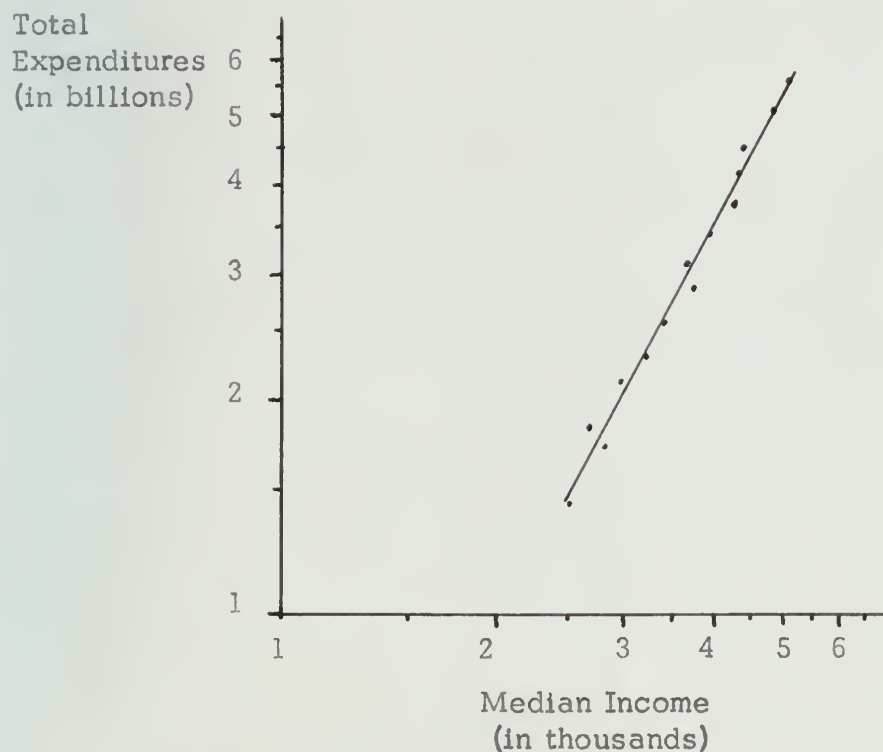


Figure V-3.—Free-hand Regression of Total Hospital Expenditures and Median Income



### Hospital Care Consumption Function

Total expenditures for short-term hospital care from 1946-1960 increased from \$1.4 billion to \$5.6 billion. When plotted against time, the increase was rather constant in rate as shown in Figure V-4. The correlation between total expense and time is high,  $r = .9874$  and  $r^2 = .9750$ .

It would be possible to fit a regression line to these points and use the equation of the line for prediction purposes. However, this implicitly assumes that a constant increase in the dependent variable should be expected. Such an increase may or may not occur. In the event of a decrease in total expenditures, the error of estimate could be sizeable. Hence, it is preferable to obtain a predicting equation which will forecast decreases in expenditures as well as increases. This is done by the use of a multiple linear regression equation.

It seems reasonable to assume that there is a relationship between total expenditures and each of the following: population per square mile, per cent of population having hospital insurance protection, median income per spending unit and employment. Given a constant incidence of illness in the population, an increase in population would require greater expenditures for care. An increase or decrease in incidence combined with population increase would amplify or modify expenditures respectively. A decrease or increase in incidence combined with population decrease would have the reverse effect.

Structural changes in population -- age distribution, sex, race, size of family, et cetera -- may also influence total expenditures for hospital care. However, they are not included in the regression equation computed in this study inasmuch as the variables used explain almost all the variation in total expenditures.<sup>1</sup>

The relationship between expenditures and insurance may be expected on the grounds that there may be less reluctance for an individual to seek medical care, including hospitalization, if he has insurance than if he is not insured. Even though his total bill may not be paid by the insurance, he may feel that he can take care of the uninsured portion without wrecking his budget. Moreover, the fact that a patient has insurance may influence his physician's decision to hospitalize him rather than attempt to treat the patient at home or in the physician's office.

If it is assumed that families have more discretionary income as their incomes increase, they may choose to spend increased amounts on the purchase of medical care. As median income increases, there will be increased numbers of families with greater discretionary income. Hence, there could reasonably be expected to be an increase in total hospital expenditures.

---

<sup>1</sup>The American Medical Association study found family size and age of head of family to be useful in predicting the size of gross hospital expenditure per admission. The standard errors of net regression coefficients were large for each variable however. See Commission on the Cost of Medical Care. Vol. I , p. 68.

Approximately two-thirds of the nation's income<sup>1</sup> is derived from wages and salaries. Hence, income is related to employment. With a change in employment and the derived change in income, one may expect a change in expenditures for hospital care.

Using data for the variables mentioned above, the multiple linear regression equation is computed as

$$X_{1.2345} = -16,377.9159 + 396.68304X_2 - 39.522491X_3 + \\ .3408079X_4 - 11.26052X_5$$

where:  $X_2$  - population per square mile

$X_3$  - per cent of population having hospital insurance

$X_4$  - median income

$X_5$  - employment (in millions)

The predicted and observed values of  $X_{1.2345}$  are shown in Table V-4. The values indicate that the equation fits the data well. The standard error of estimate is 53.9488. Corrected for small sample size it becomes 67.2860.

The percentage of variation in  $X_1$  explained by corresponding variation in variables  $X_2 \dots X_5$  is 99.9080, and it is 99.8672 per cent when corrected for sample size. This is an improvement over  $r^2 = .9750$  for the simple correlation between total expense and time. Although only 2.5 per cent of the variation in  $X_1$  was not related to time, the  $R^2$  explains an additional

---

<sup>1</sup>See page 37 and Table II-C, Appendix II.



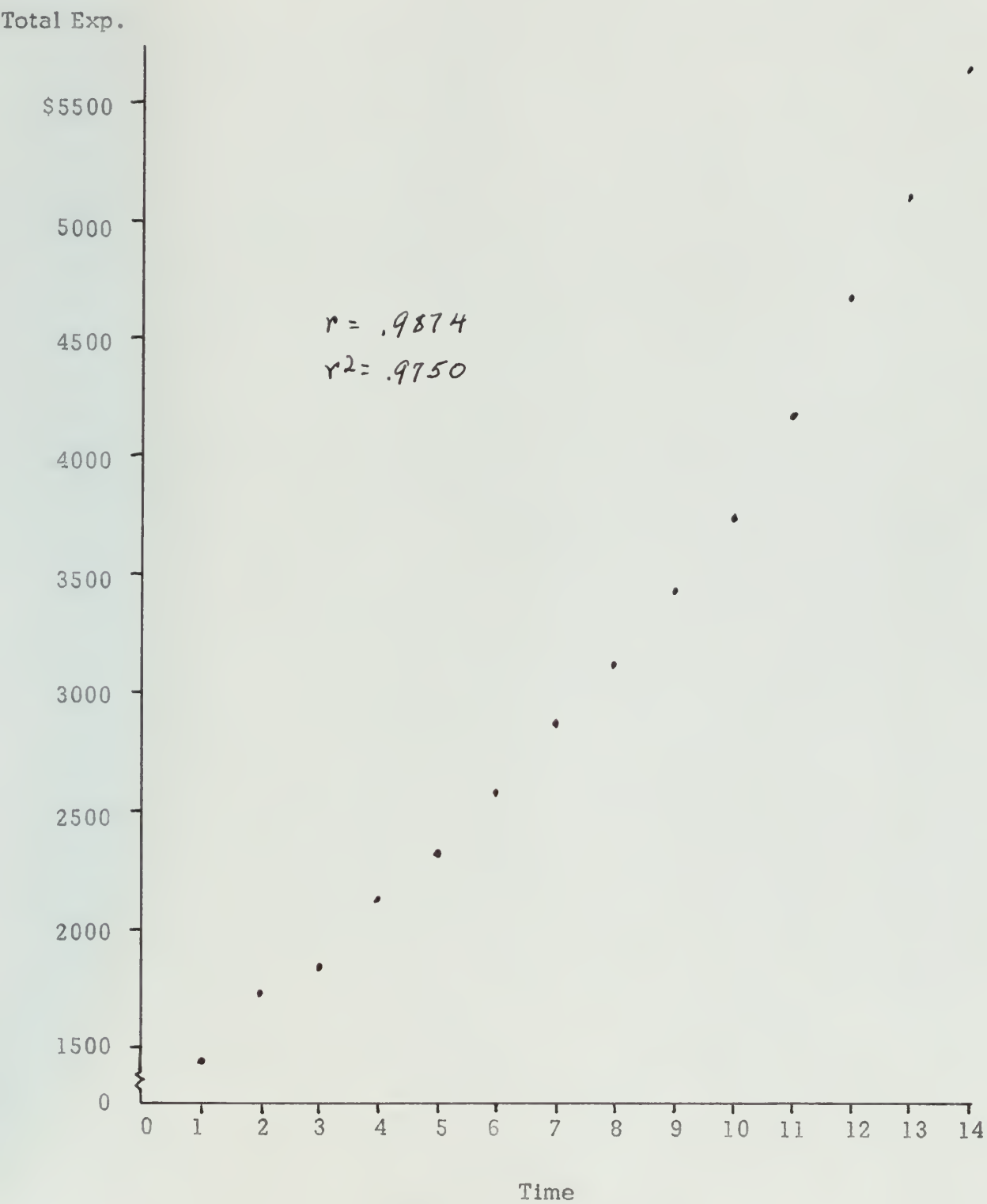


Figure V-4.-Simple Correlation, Total Hospital Expense and Time

2.3672 per cent. Expressed another way, the substitution of the other variables explains 94.688 per cent<sup>1</sup> of the variation not explained in the simple correlation.

Computing beta coefficients to determine the relative importance of the independent variables, one obtains the following values.

$$\beta_2 = 1.1710$$

$$\beta_3 = -.3732$$

$$\beta_4 = .2106$$

$$\beta_5 = -.0292$$

It is apparent that the most important variable is population followed by insurance coverage and median income. Employment is of little importance.

The standard errors of the net regression coefficients reiterate the inferences suggested by the beta coefficients. Using twice the standard error or approximately a 5 per cent significance level, the confidence intervals of Table V-5 are computed.

It is apparent that  $b_5$  may be zero. Some question may also be raised about the importance of  $b_4$  inasmuch as the confidence interval involves a change of signs even though the negative value is small.

In order to obtain confidence limits for estimates of  $X_1$  values associated with subsequent years, the standard error of the forecast was obtained. This is shown in a section of Appendix V, Table V-A.

---

<sup>1</sup>  $2.3672/2.5000 = .94688$

TABLE V-4.--Deviations of predicted from observed total expense values

Year	Observed $X_1$	Predicted $X_{1.2345}$	Deviations $X_1 - X_{1.2345}$	Deviations Squared $X^2$
1947	1434	1478.3440	-44.3440	1966.3903
1948	1724	1728.1840	- 4.1840	17.5059
1949	1842	1875.8938	-33.8938	1148.7897
1950	2120	2039.1826	80.8174	6531.4521
1951	2314	2246.9853	67.0147	4490.9700
1952	2577	2532.0545	44.9455	2020.0980
1953	2868	2838.8557	29.1443	849.3902
1954	3121	3148.9904	-27.9904	783.4625
1955	3434	3512.9562	-78.9562	6234.0815
1956	3743	3839.7192	-96.7192	9354.6036
1957	4161	4191.4381	-30.4381	926.4779
1958	4655	4609.7100	45.2900	2051.1841
1959	5091	5106.7450	-15.7450	247.9050
1960	5617	5552.0782	64.9218	4214.8401
Total			- 0.1370	40,837.1509

TABLE V-5.--Confidence intervals for net regression coefficients

Statistic	$X_2$	$X_3$	$X_4$	$X_5$
b	396.6830	-39.5225	.3408	-11.2605
$s_b$	51.6218	5.4381	.1707	32.1223
conf. int. (upper limit)	499.9266	-28.6463	.6822	20.8618
(lower limit)	293.4394	-50.3987	-.0006	-75.5051



The data of this study consist of time series. However, for each year's data, totals rather than sample values were used. These totals may be viewed as sample values drawn during a short period of time from a universe extending over a much longer period of time. To test whether autocorrelation was present, an autocorrelation ratio of 1.4519 was computed by von Neumann's method of successive differences. Critical values are 1.2725 and 3.0352. Hence, the test indicated no significant autocorrelation in the series.

Figure V-5 shows that there is high linear intercorrelation among all the variables. Only one set of data has a correlation coefficient smaller than .92. Consequently, the price variables were deflated by the consumers' price index in order more nearly to ascertain any real relationship between total expense and the other variables. No attempt was made to adjust non-monetary variables inasmuch as no logical basis for such adjustment appears to exist.

Although the demand function is expressed in terms of total expense, it could easily be transformed into the more usual quantity function by dividing both sides of the equation by patient-day expense.

#### Hospital Care Consumption Function Adjusted for Price Level Changes

After adjustment is made for price level changes, the intercorrelations appear as shown in Figure V-6. Thus, deflation by the consumers' price index increases the intercorrelation. The same effect, an increase in

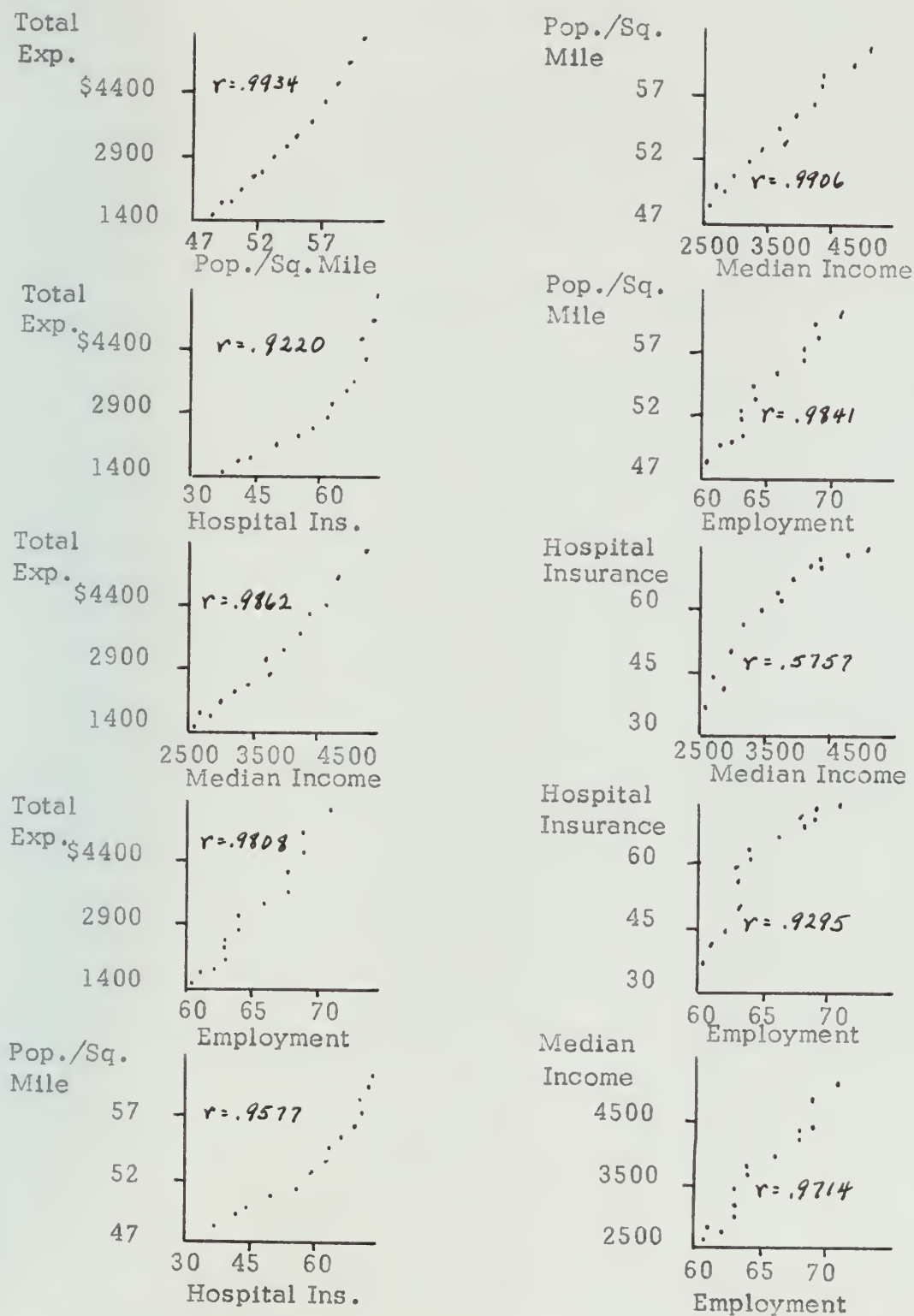


Figure V-5.--Intercorrelations of Variables Appearing in Hospital Care Consumption Function

correlation, is obtained in the relationship between time and total expense. See Figure V-7.

The multiple regression equation became  $X_1 .2345 = -12,221.3744 + 271.57172X_2 - 23.405957X_3 + .22281942X_4 + 15.39264X_5$ .

Table V-6 reveals that this predicting equation gives a somewhat better fit in that the sum of the deviations squared is less than one third as large as the unadjusted sum. Also, the corrected standard error of the estimate is reduced from 67.2860 to 36.4361.  $R^2$  increases from .9982 to .9989.

Although some small changes occurred in the sizes of the beta coefficients, their rankings remained unchanged. Population and insurance coverage were still the strongest variables in effecting change.

Sizeable changes in the standard errors of the regression coefficients result. Again, using twice the standard errors, confidence intervals are obtained as shown in Table V-7.

Although these confidence intervals differ from those of the regression coefficients for the unadjusted data, they are similar in that population and insurance remain statistically significant and median income becomes significant.

All of the coefficients of the variables in the standard error of the forecast are smaller.<sup>1</sup> Thus, price adjusted data yield more precise forecasts than do unadjusted data.

---

<sup>1</sup>See Table V-B, Appendix V.



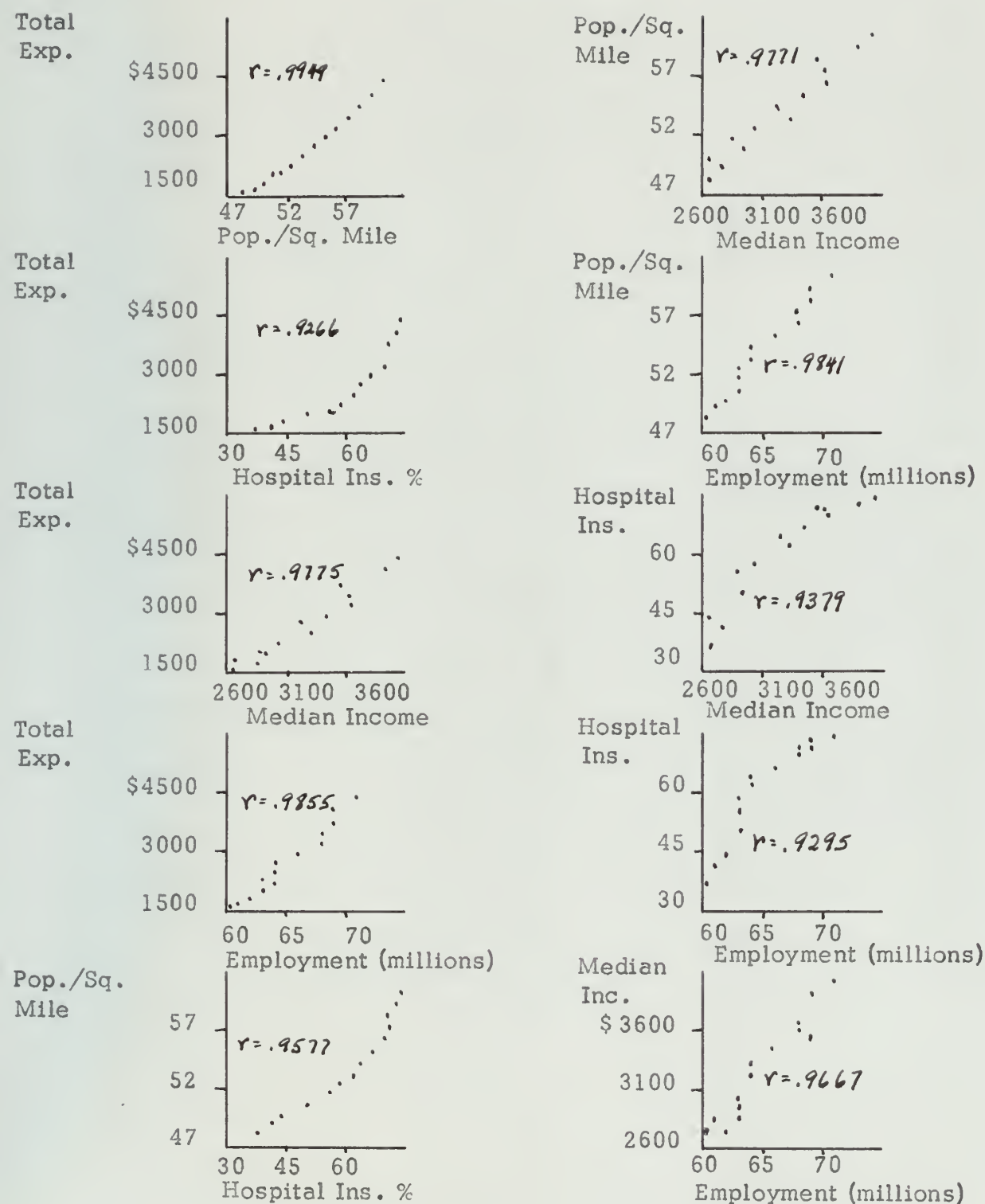


Figure V-6.-Inter correlations of Variables Appearing in Hospital Care Consumption Function, Adjusted for Price Level Changes

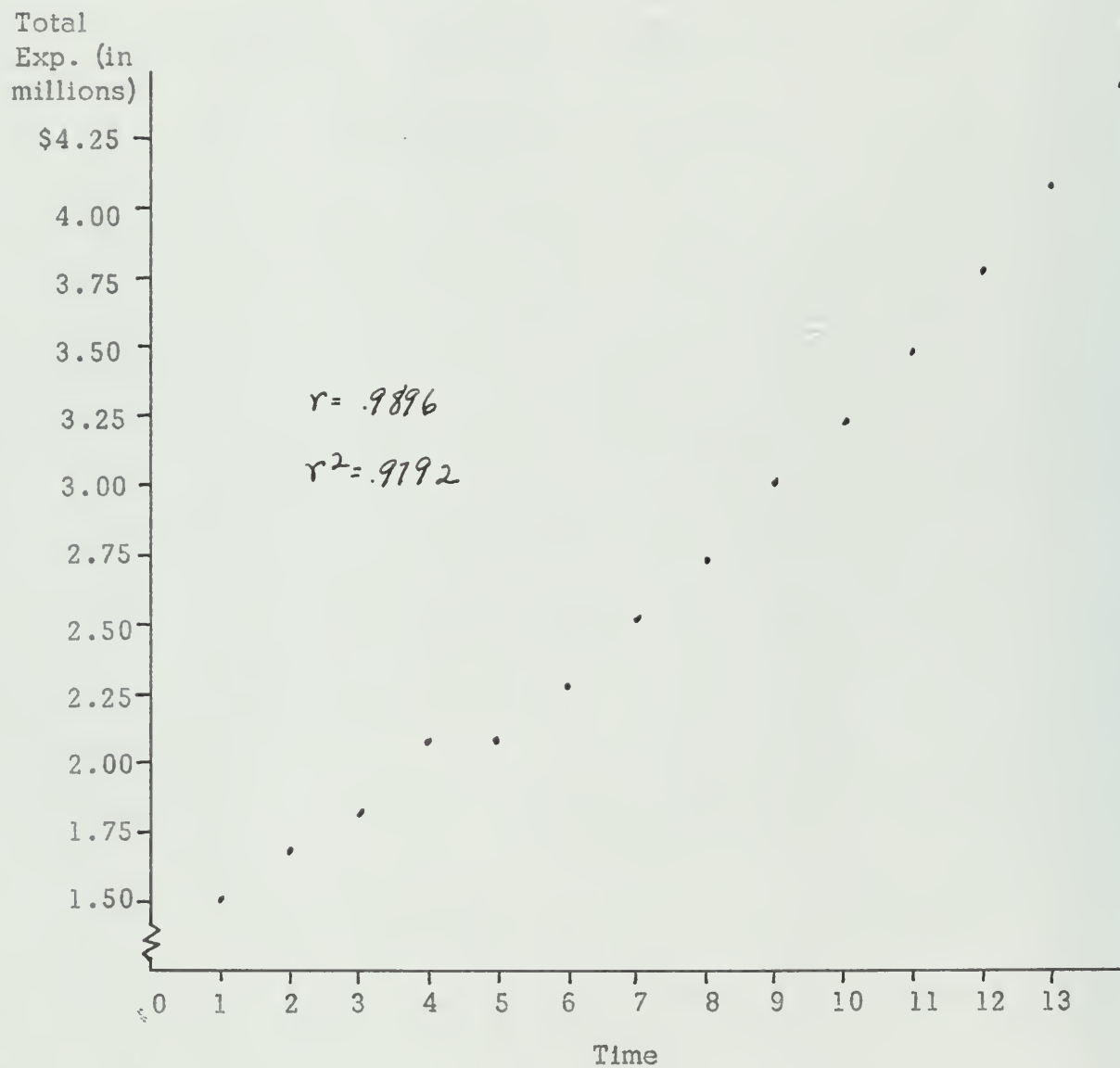


Figure V-7.--Simple Linear Correlation of Total Hospital Expense, Adjusted for Price Level Changes, and Time

TABLE V-6.-Deviations of predicted from observed total expense values, adjusted for price level changes

Year	Observed $X_1$	Predicted $X_{1.2345}$	Deviations $X_1 - X_{1.2345}$	Deviations Squared $X^2$
1947	1502	1523.1909	-21.1909	449.0542
1948	1677	1689.0291	-12.0291	144.6992
1949	1809	1831.4095	-22.4095	502.1857
1950	2062	1978.2126	83.7874	7020.3284
1951	2085	2086.0957	- 1.0957	1.2006
1952	2270	2268.7883	1.2117	1.4682
1953	2507	2494.0556	12.9444	167.5575
1954	2719	2712.4699	6.5301	42.6422
1955	2999	3008.8973	- 9.8973	97.9565
1956	3221	3268.7706	-47.7706	3282.0302
1957	3462	3485.0633	-23.0633	531.9158
1958	3769	3768.9122	.0878	.0077
1959	4086	4081.9124	4.0876	16.7085
1960	4440	4411.3042	28.6958	823.4489
Total			- 0.1116	12081.2036

TABLE V-7.-Confidence intervals for net regression coefficients, adjusted

Statistic	$X_2$	$X_3$	$X_4$	$X_5$
b	271.5717	-23.4060	0.2228	15.3926
$s_b$	21.2989	2.9396	0.1043	17.4824
conf. int. (upper limit)	314.1695	-17.5268	0.4314	50.3574
(lower limit)	228.9739	-29.2852	0.0142	-19.5722



An improvement also occurs in the test for autocorrelation. The ratio for unadjusted data was 1.4519. Although not significant, it tended toward the positive autocorrelation limit of 1.2725. For adjusted data, the ratio becomes 2.2124, just slightly on the negative side of the midpoint, 2.1539, between the limits.

### Summary

Simple demand curves relating price and quantity have been computed in this chapter. Two different measures of quantity were used, patient-days and admissions, but both showed essentially the same relationships. During the early years of the study, demand was quite inelastic. However, it appeared to shift and become more elastic in the later years. The shift was attributed to the change in percentage of population having hospital insurance coverage.

Hospital care consumption functions were computed using both unadjusted data as well as data that were adjusted for price level changes. Although the equations differed, they possessed the same general characteristics. Almost all variation in the dependent variable was associated with variation in the independent variables. The most important independent variables in explaining variation were population, percentage of population having insurance coverage and median income respectively. Employment was of little importance.

Inasmuch as only 14 observations were available, the computed statistics were adjusted for small sample size. Finally, tests for autocorrelation were made. No significant autocorrelation was found.

## CHAPTER VI

### Hospital Cost Functions

#### Review of Pertinent Economic Theory

The "short-run" in economics is defined such that the size of plant remains fixed.<sup>1</sup> Hence, analysis of short-run costs reveals how costs vary in response to output within a time period short enough that plant size is fixed. The costs which directly arise from the plant -- depreciation, property taxes, et cetera -- are constant regardless of amount of output. Other costs will vary with volume of output.<sup>2</sup> These are graphed in the general case as shown in Figure VI-1.

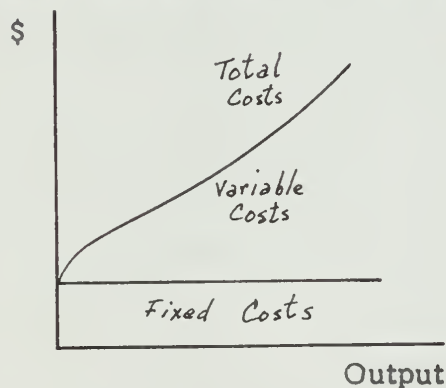


Figure VI-1.--Generalized Short-run Total Cost Function

---

<sup>1</sup>Spencer and Siegelman, p. 314.

<sup>2</sup>Donald S. Watson, Price Theory and Its Uses (Boston: Houghton Mifflin Co., 1963), pp. 167ff.

In order to obtain additional information about the firm's cost structure, it may be desirable to compute the equations of average and marginal cost curves. These may then be graphed as in Figure VI-2 which shows the average total cost, average variable cost and marginal cost curves.

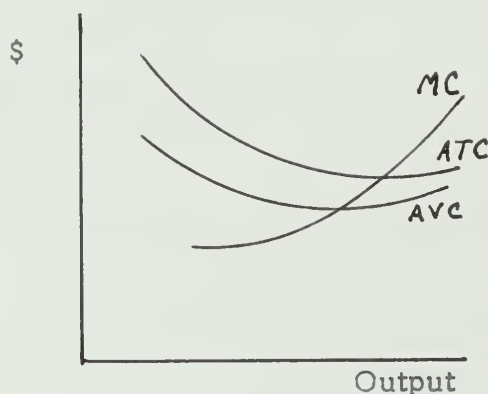


Figure VI-2.-Generalized Short-run Average and Marginal Cost Functions

Every plant size has a corresponding set of short-run costs. For planning purposes, especially when planning to expand capacity, management will need to know how the cost functions vary with different plant sizes. Once the functions are obtained, they may be graphed as in Figure VI-3. If size is variable continuously, there will be an infinite number of short-run cost curves each corresponding to a different size. It is usually thought that the minimum of each successive curve, from smallest to largest, will at first decrease until some absolute minimum is reached and thereafter increase.<sup>1</sup> The long-run average total cost curve

---

<sup>1</sup>Spencer and Stegelman, p. 315.



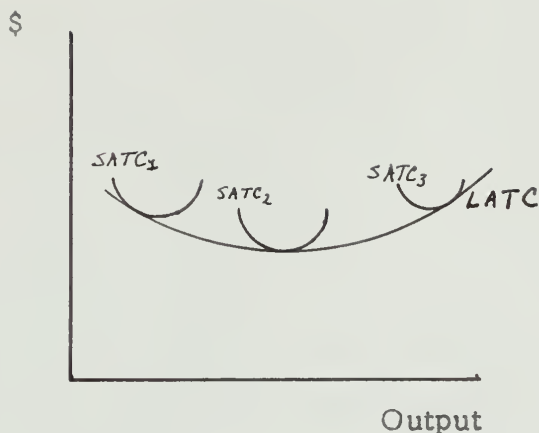


Figure VI-3.—Short-run and Long-run Average Total Cost Functions

generalizes the short-run curves by enveloping them all. The point of tangency between the long-run curve and each short-run curve represents the lowest cost for producing the corresponding level of output.

In a study which compares cost functions of various sizes of plant, one needs to have data for firms of several different sizes. For each size, certain conditions must prevail if the study is to be valid.<sup>1</sup>

1. Each output observation should come from a time period in which the rate of production is constant.
2. For each pair of observations of cost and output, the cost should be directly associated with the output figure.
3. Costs should be observed over widely differing rates of output.
4. The cost-output data should not contain influences of any extraneous factors, i.e., changes in costs of factors of production, et cetera.<sup>2</sup>

---

<sup>1</sup>J. Johnston, Statistical Cost Analysis (New York: McGraw-Hill Book Co., Inc., 1960) pp. 26, 27.

<sup>2</sup>Joel Dean, Managerial Economics (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1951), p. 306.

Also, total costs should usually be used instead of average costs inasmuch as the results may be expected to be more reliable statistically and the average and marginal cost functions are easily derived from the total cost function.<sup>1</sup>

### Assumptions and Data Adjustments

The ideal criteria outlined above have not been met in this study. However, statistical adjustments have been made to correct the data where possible. These adjustments will be explained in the following paragraphs.

The data available for this study consist of total costs for each of several different hospital size classifications and the average costs per patient-day for each of these classifications.<sup>2</sup> If total costs were used, as is desirable, some adjustment would have to be made for the changing number of hospitals in each category from year to year. This could be done; however, it seems that use of such adjusted data would yield no benefit beyond that to be derived from the use of total costs per patient-day.<sup>3</sup>

---

<sup>1</sup>Spencer and Siegelman, p. 320.

<sup>2</sup>See Tables IV-12 through IV-21 of chapter four.

<sup>3</sup>Total costs per patient-day are analogous to short-run average total costs shown in Figures VI-2 and VI-3.

Annual time periods are used. There may be seasonal variations in the occupancy rate.<sup>1</sup> However, inasmuch as data for the entire hospital industry are used, seasonal effects from one area of the nation to another may be expected to cancel out each other. Also, the seasonal fluctuations should be similar from year to year. Consequently, their effects on annual costs should be constant. Hence, it is assumed that the rate of output is nearly constant for each size category throughout the year.

Although there may be some problems of allocating costs incurred immediately before the end of one year or after the beginning of the succeeding year, the size of such error relative to total costs and output for the year would be small. Aside from the fact that in this study data were available only on an annual basis, one of the main reasons for choosing to use annual data in studying cost functions is the ease of pairing costs directly with output.<sup>2</sup> This use of annual cost figures constitutes one of the favorable features of the data used in this study.

Conversely, one of the least desirable features is the narrow range of output rates. The narrowness of this range precludes the development of more than a small portion of the cost curve for each size category. Also, since only a few observations are available, it seems reasonable to use a linear approximation of the segment of the curve involved rather than attempt to fit a higher degree equation to the data. Moreover, while it

---

<sup>1</sup>Occupancy percentage is the measure of output used in this study.

<sup>2</sup>Joel Dean, p. 285.



would be useful to hospital administrators to know something about average variable costs and marginal costs, the information to be gained by computing the equations of these curves from the data of this study is too fragmentary to be of much usefulness. Consequently, they are not computed. Equations for average total costs are computed and these equations are graphed for each of the different sizes.

As pointed out in the first chapter, the size classifications by which data were reported were changed in 1953. Costs and other types of information were reported in four categories from 1946 through 1952. From 1953, information has been reported in seven categories. Comparing the short-run average total costs of each size class for the two periods 1946-1952 and 1953-1960, one can obtain a crude estimate of the movement of the long-run average total cost curve of the industry even though complete short-run curves or the long-run curve may not be computed.

Several adjustments of the data are required in order to eliminate the influence of extraneous factors. First, no rectification is made to eliminate fixed costs. It is assumed that the distribution of different sized hospitals within each category was even. Though some hospitals may have changed size categories because of additions to, or deletions from, their rated capacity in 1946, still the level of fixed cost for each size category would remain almost constant because of the small influence of any one hospital. Moreover, elimination of fixed costs from total costs is unnecessary in determining the variation in variable costs since only the level of the total cost curve is affected by fixed costs.

Other assumptions which obviate rectification of the data are:

1. all hospitals use essentially similar accounting methods
2. managerial skill is not significantly different among the various sizes of hospitals
3. location factors are relatively unimportant.

Inasmuch as there seems to be no way to measure the rate of technological change, the assumption is made that such change is introduced uniformly throughout all hospital size classes and at an almost constant rate over time. Consequently, a time factor is written into the equations to allow for the change. The "t" test is made to determine the significance of the time effect. If it is significant at the 5 per cent level, an adjustment is made to the data by computing what the cost would have been for each year if there had been no time trend. Thus, the general form of the regression equation is --

$$Y_C = a + b_1 X + b_2 T$$

and the adjustment to cost is made by plugging the appropriate value of T into the general expression --

$$Y + b_2 T$$

in order to arrive at cost corrected for the time trend.

Prices for inputs also changed during the time period under consideration. However, there seems to be no general price index which is applicable to hospital costs. Therefore, it is necessary to make adjustments to individual components of the hospital cost mix in order to arrive at a total cost figure adjusted for price level changes. As has been shown in

a previous chapter, payroll constitutes the largest single item of expense for hospitals. For the purposes of computing the constant dollar costs, all expenses other than payroll are divided into two categories -- depreciation, and drugs and supplies.

National wage levels have been computed by the Bureau of Labor Statistics only since 1960;<sup>1</sup> thus, it is necessary to derive one's own index for years prior to 1960. Such a labor cost index is computed for this study by using the 1947-49 arithmetic average of median income as the base for professional as well as unskilled workers. Each year's median income is divided by the base amount then the ratio is multiplied by 100 to get the index figure. Finally, the simple arithmetic average of these two amounts is obtained to get the total labor cost index for each year since it is assumed that hospital employees are about equally divided between the professional and unskilled. The results of such computations are shown in Appendix VII, Table A.

The drugs and supplies portion of the consumers' price index, is used to adjust for changes in the drugs and supplies portion of hospital costs. Depreciation changes are adjusted by the construction materials price index. The three sets of index figures are shown in Table VI-1.

---

<sup>1</sup>"Metropolitan Area Pay Levels and Trends in 1965," Monthly Labor Review Vol. 89, No. 1 (January, 1966) p. 27.



For each size category, each year's total costs are divided into three sections as follows:

First, payroll costs as recorded in the tables of chapter four are subtracted from total costs.

Then from the difference the sum of 4 per cent of total costs is subtracted to represent depreciation.<sup>1</sup>

The final difference is the portion of total costs arising from expenditures for drugs and supplies.

The appropriate deflator is applied to each type of cost in order to obtain the constant dollar cost. Table VI-2 shows the results of such computations for one size category.

A summary of the constant dollar total costs for all size categories is shown in Tables VI-3 and VI-4.

Probably the largest influence on total hospital costs during the years 1946-1960 was exerted by the change in the nature of illnesses for which patients were hospitalized. For example, with the introduction of open heart surgical techniques, it is reasonable to expect that patients having serious heart ailments would seek surgical correction. In former years,

---

<sup>1</sup>In Factors Affecting the Costs of Hospital Care, p. 72, The Commission on Financing of Hospital Care in the United States points out that "A capital investment of \$12,000 per bed represents about \$9,000 invested in buildings, \$1,800 in equipment and \$1,200 in land. At average depreciation rates of 2 per cent for buildings and 10 per cent for equipment, the total annual depreciation amounts to \$360 per bed." The total depreciation rate is 3 1/3 per cent. (\$360/\$10,800). Controllers of community hospitals in the Benton Harbor, Michigan, area confirmed that their total depreciation rates in recent years have fluctuated from slightly over 3 per cent to about 4.5 per cent of total investment. It seemed appropriate, therefore, to use about a 4 per cent rate for depreciation in this study.

TABLE VI-1. Deflators for hospital costs (1947-49=100)

Year	Wages and Salaries <sup>a</sup>	Drugs and Supplies <sup>b</sup>	Depreciation <sup>c</sup>
1946	--	--	69.3
1947	105.0	105.3	94.0
1948	95.4	101.0	104.0
1949	99.8	93.6	102.0
1950	104.5	92.5	109.5
1951	107.6	95.6	119.6
1952	118.0	92.5	118.2
1953	119.7	92.9	119.9
1954	129.9	93.9	120.2
1955	143.4	92.8	125.5
1956	136.0	92.1	130.6
1957	140.4	93.3	130.6
1958	140.7	94.0	130.5
1959	145.0	93.4	134.6
1960	153.1	94.6	132.6

<sup>a</sup>Computed from median income of professional and unskilled spending units equally weighted.

<sup>b</sup>Taken from Statistical Abstract of the United States: 1953, 1957, 1959, 1961 (74th, 78th, 80th, 82nd eds.; Washington, 1953, 1957, 1959, 1961).

<sup>c</sup>Taken from Table II-12, construction materials column.

TABLE VI-2.-Current and constant dollar (1947-49=100) costs per patient-day for all short-term general and other special hospitals under 50 beds in size

Year	Current \$				Constant \$			
	Total	Payroll	Depr.	Drugs & Supplies	Payroll	Depr.	Drugs & Supplies	Total
1946	8.93	4.40	.36	4.17	4.19	.52	3.96	8.67
1947	10.59	5.19	.42	4.98	4.94	.45	4.73	10.12
1948	11.52	5.46	.46	5.60	5.72	.44	5.54	11.70
1949	12.35	6.26	.49	5.60	6.27	.48	5.98	12.73
1950	14.90	7.66	.60	6.64	7.33	.55	7.18	15.06
1951	14.86	7.60	.59	6.67	7.06	.49	6.98	14.53
1952	16.21	8.38	.65	7.18	7.10	.55	7.76	15.41

TABLE VI-3.-Total costs per patient-day in constant dollars (1947-49=100) for all short-term general and other special hospitals, 1946-1952

Year	Under 50 beds	50-99	100-249	250 and over
1946	8.67	8.57	9.31	9.26
1947	10.12	9.73	11.11	10.58
1948	11.70	12.36	13.24	14.13
1949	12.73	14.26	14.78	15.32
1950	15.06	15.31	16.33	15.45
1951	14.53	15.23	16.78	16.59
1952	15.41	16.15	17.74	17.44

patients with the same illnesses perhaps may have required continuing medical care. But the majority of such care would probably not have been received while they were hospitalized. In view of technological changes in medical care, e.g. antibiotics, chemotherapy, cobalt therapy, heart surgery, et cetera, it seems reasonable to infer that more complex cases



are increasingly being cared for. Unfortunately, there seems to be no acuity index measuring the changes in complexity and degree of severity of the various illnesses for which patients are hospitalized. In the absence of such an index, the assumption is made that the number of employees required to care for each patient provides some measure of the composition of the types of cases hospitalized as well as the severity of the cases. Consequently, the total costs in constant dollars are divided by the number of employees<sup>1</sup> per patient to adjust for changes in types and severity of illness.

TABLE VI-4.--Total Costs per patient-day in constant dollars (1947-49=100) for all short-term general and other special hospitals, 1953-1960

Year	Under 25 beds	25-49	50-99	100-199	200-299	300-499	500 & over
1953	16.26	16.36	17.38	18.63	20.24	19.29	17.26
1954	16.48	16.84	17.55	19.13	20.73	20.16	18.39
1955	18.14	17.06	17.48	19.05	20.87	20.42	18.64
1956	18.33	18.01	18.68	21.22	22.08	21.70	20.15
1957	19.16	18.91	20.06	21.77	23.18	23.12	22.13
1958	20.78	20.88	21.74	23.37	24.86	25.19	23.80
1959	21.91	21.75	22.62	24.52	25.74	26.17	22.91
1960	22.10	22.26	23.55	25.10	26.69	26.89	26.15

The results of the adjustments are shown in Tables VI-5 and VI-6.

<sup>1</sup>The data of Tables IV-7 and IV-8 were divided by 100 to obtain the number of employees per patient.

TABLE VI-5.-Total costs per patient-day in constant dollars (1947-49=100)  
for all short-term general and other special hospitals ad-  
justed for number of employees required per patient,  
1946-1952

Year	Under 50 bds.	50-99	100-249	250 & over
1946	7.41	6.49	6.08	5.90
1947	8.43	7.48	7.21	6.08
1948	8.93	8.77	8.22	7.98
1949	9.72	9.26	8.59	8.46
1950	10.32	9.45	8.69	8.49
1951	9.69	9.07	9.48	9.59
1952	9.63	9.73	9.86	9.85

TABLE VI-6.-Total costs per patient-day in constant dollars (1947-49=100)  
for all short-term general and other special hospitals ad-  
justed for number of employees required per patient,  
1953-1960

Year	Under 25 bds.	25-49	50-99	100- 199	200- 299	300- 499	500 & over
1953	10.36	10.22	9.99	9.86	10.33	10.15	10.03
1954	9.42	9.62	9.38	9.20	9.82	9.83	10.10
1955	10.02	9.53	9.15	9.25	9.66	9.54	9.66
1956	10.91	9.90	9.63	10.25	10.04	9.91	10.13
1957	10.19	10.28	10.03	10.22	10.39	10.37	10.85
1958	10.94	11.05	10.82	10.72	10.86	10.86	11.02
1959	10.79	11.10	10.93	10.95	11.09	11.18	11.46
1960	11.16	11.30	11.06	11.06	11.36	11.35	11.62

It is evident from a comparison of the four Tables, VI-3 through VI-6, that the adjustments made a sizeable change in the patient-day costs. The effects of the adjustments can be discerned by showing them in tabular

form as in Table VI-7. The 50-99 size category is used in order to show the changes for the entire period of the study.

TABLE VI-7.-Total costs per patient-day, unadjusted and adjusted, of 50-99 beds hospitals, 1946-1960

Year	Total Costs, Unadjusted	Total Costs in constant dollars (1947-49=100)	Constant dollar costs # emp./pt.
1946	8.83	8.57	6.49
1947	10.18	9.73	7.48
1948	12.13	12.36	8.77
1949	13.86	14.26	9.26
1950	15.19	15.31	9.45
1951	15.65	15.23	9.07
1952	17.12	16.15	9.73
1953	18.68	17.38	9.99
1954	19.79	17.55	9.38
1955	20.67	17.48	9.15
1956	21.47	18.68	9.63
1957	23.55	20.06	10.03
1958	25.61	21.74	10.82
1959	27.08	22.62	10.93
1960	29.09	23.55	11.06

Price level changes accounted for a limited amount of change in hospital costs per patient-day during the early years involved in this study. During the last six or seven years, price level changes accounted for larger amounts. But, Table VI-7 shows that larger changes in costs were caused by the changing composition of patient loads and the severity of their illnesses as manifested in the number of employees required to care for a patient.



In terms of percentage, there were increases in patient-day costs between the beginning and end of the period as follows.

229% -- unadjusted

175% -- adjusted for price level changes

70% -- adjusted for price level and employees required

If each size class of hospitals had been operating at approximately a constant percentage of capacity and all conditions other than those for which adjustments have been made had remained constant, the rectifications, if complete and accurate, should have eliminated all change in patient-day costs. The 70 per cent change in costs could be assumed to result from changes in occupancy percentage.

It seems reasonable to conclude that the rectifications may not have been completely correct. Nevertheless, changes in costs remaining after the adjustments can be assumed to result largely from changes in the rates at which hospitals were operated, commonly referred to as occupancy percentage.

### Short-run Costs

In order to determine how costs vary with occupancy percentage, scatter diagrams have been plotted for each size category. These are shown in Figure VI-4. A regression line has been fitted to each plot. The method of least squares was used to compute simple linear regression equations which were then graphed to form the lines shown on each scatter diagram. Table VI-8 summarizes the equations.

In order to correct for changes occurring over time, a time factor was explicitly written into the equations. Multiple linear regression equations were then computed for each size category. Significance of time in each equation was determined by the use of the "t" test. For the four categories in which time did significantly affect costs, adjustments for the time effects were made and new simple linear regression equations were computed. No new simple linear equations were computed for the categories in which time was not significant.

TABLE VI-8.-Coefficients for simple linear regression equations

Size	a	b
1946 - 1952		
Under 50 beds	21.743	-0.213
50-99	26.326	-0.262
100-249	37.024	-0.577
250 & over	- 7.902	0.202
1953 - 1960		
Under 25 beds	- 1.664	0.228
25-49	- 9.822	0.348
50-99	-21.184	0.479
100-199	-26.175	0.499
200-299	-22.193	0.424
300-499	-21.759	0.407
500 & over	16.823	-0.078

A useful check on the accuracy of the computations is provided by adjusting the multiple regression equation. Except for rounding errors, the adjustment yields the same simple linear equation as that computed

from the adjusted data. The adjustment is made by adding the average value of time to the intercept if costs increase over time or subtracting it if costs decrease over time. In Table VI-9, the equation for the 50-99 size is  $X_1 = 9.148 - .008X_2 + .477X_3$ . Since the average value of time used in computing this equation is zero, the simple linear equation is  $Y = 9.148 - .008X$ . This is the same as the equation shown in Table VI-10 except for rounding errors.

Table VI-9 summarizes the multiple regression equations, tests of significance and correlation with time eliminated.

TABLE VI-9.-Coefficients for multiple linear regression equations, simple correlation and determination, and "t" values

Size Category	a	b <sub>2</sub>	b <sub>3</sub>	t	r	r <sup>2</sup>
1946 - 1952						
Under 50 beds	8.984	0.003	0.380	1.990	-.613	.371
50-99	9.148	-0.008	0.477	3.955 <sup>C</sup>	-.050	.003
100-249	-8.698	0.222	0.739	15.566 <sup>C</sup>	.953	.908
250 & over	7.221	0.011	0.687	6.476 <sup>C</sup>	.081	.007
1953 - 1960						
Under 25 beds	2.032	0.139	0.084	1.417	.739	.546
25-49	-11.800	0.385	-0.034	-0.694	.947	.897
50-99	-15.856	0.397	0.062	0.912	.941	.885
100-199	-22.330	0.446	0.033	0.418	.960	.922
200-299	-40.292	0.660	-0.137	1.292	.938	.880
300-499	- 8.620	0.240	0.113	1.076	.872	.760
500 & over	11.091	-0.014	0.271	5.019 <sup>C</sup>	-.037	.001

<sup>C</sup>Significant at 5 per cent level.

Significant "t" values at the 5 per cent level are 2.776 for four degrees of freedom and 2.571 for five degrees of freedom: they pertain respectively



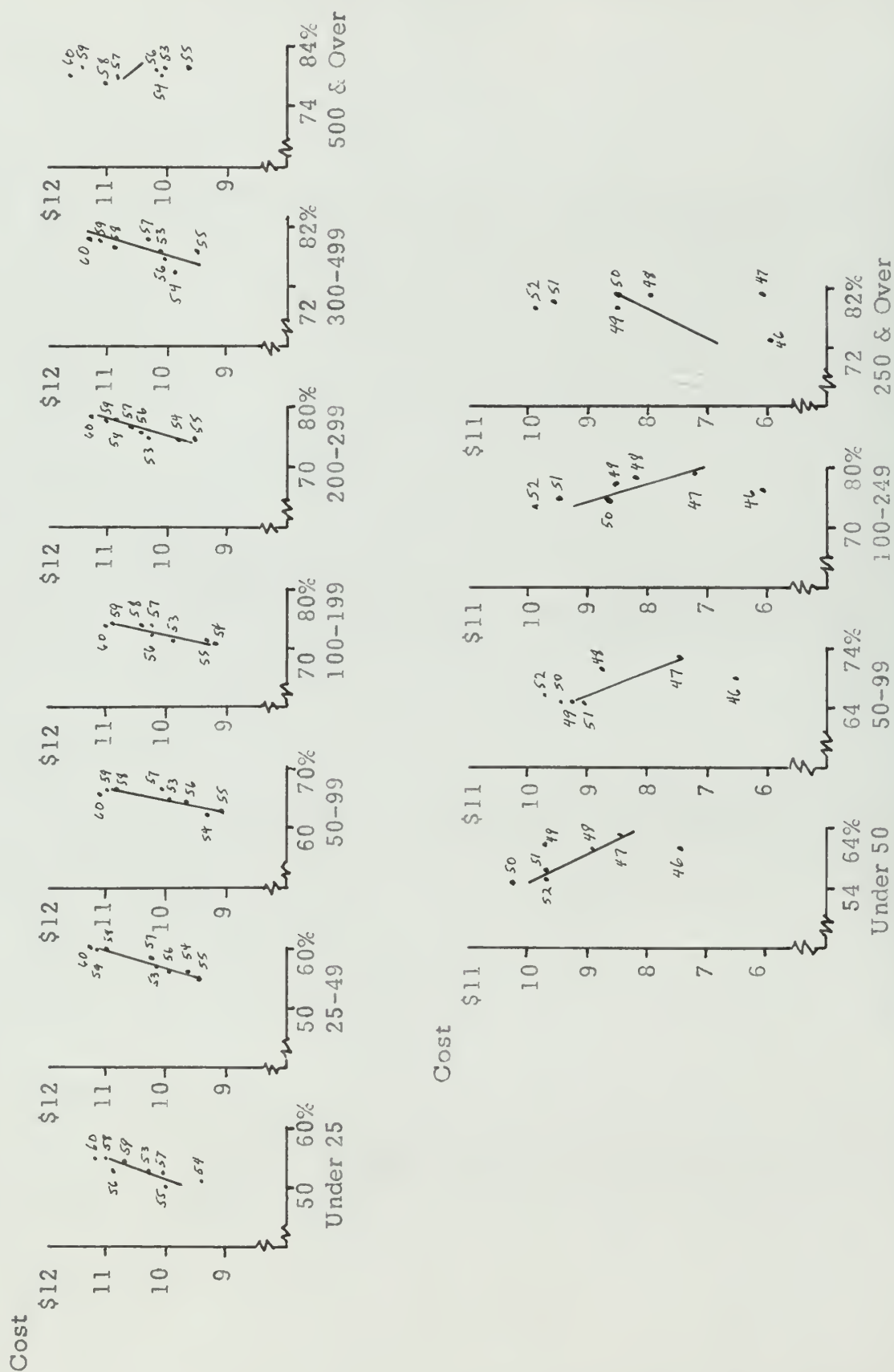


Figure VI-4.-Scatter Diagrams of Adjusted Total Costs per Patient-day and Occupancy Percentage

to the data for the years 1946-1952 and 1953-1960. The coefficients of determination indicate that the regression equation fits well only for the 100-249 size class during 1946-1952. During 1953 through 1960, the equations fit the data well for all classes except 500 and over. The scatter diagrams with the graphs of their regression equations are shown in Figure VI-5.

In the four categories for which changes over time were significant, adjustments were made according to the method explained in the previous section of this chapter. Consider the 50-99 size for the early years for example. Since patient-day costs increased in the amount of \$.477 for each year, this cost trend was eliminated by subtracting the product of \$.477 and  $b_3$  from each year's total cost per patient-day.

The new simple linear regression equations for the four sizes in which time was significant are shown in Table VI-10.

TABLE VI-10.-Coefficients for simple linear regression equations, corrected for time

Size	a	b
1946 - 1952		
50-99	9.202	-0.009
100-249	-8.619	0.228
250 & over	7.122	0.012
1953 - 1960		
500 & over	11.600	-0.014

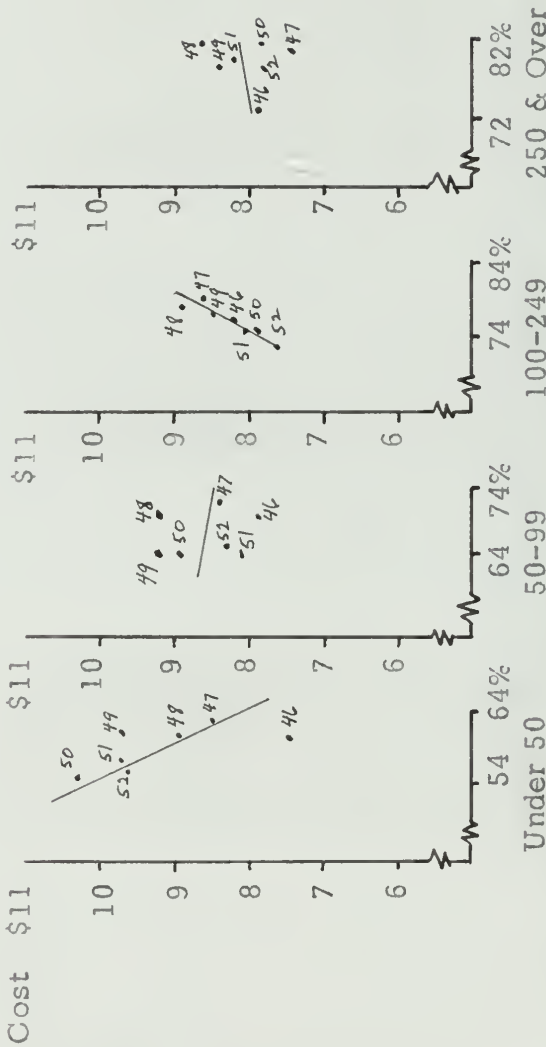
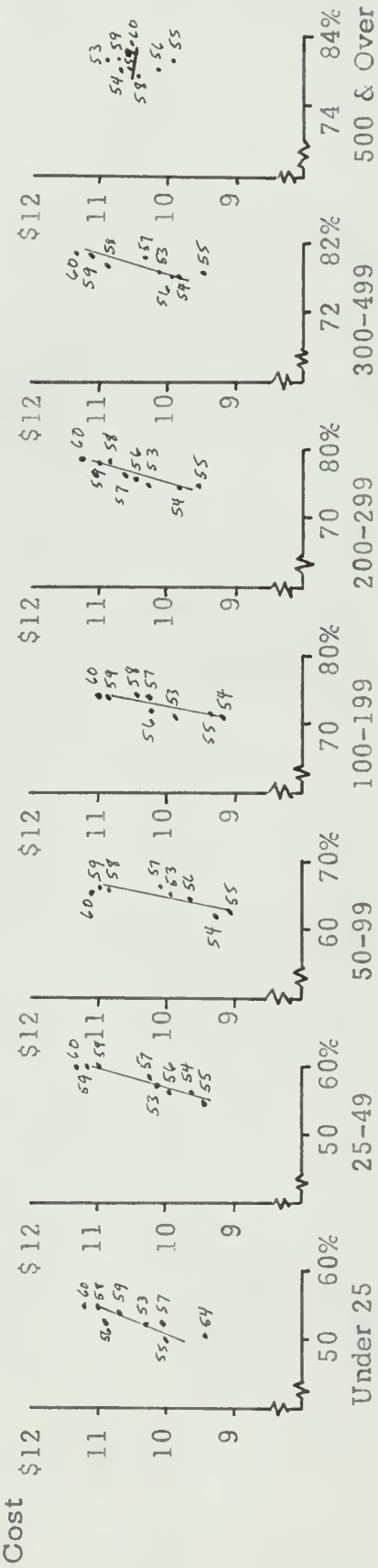


Figure VI-5.-Scatter Diagrams of Adjusted Total Costs per Patient-day and Occupancy Percentage Corrected for Time



As previously mentioned, because of the nature of the data used in this study, the costs shown in this chapter are the economist's average total costs. Heretofore, they have been referred to as total costs per patient-day. The plot of these points on the scatter diagrams represents a few of the points which would be plotted if variation in output had extended throughout the entire range of operations from zero to 100 per cent. Therefore, the regression curves graphed on the diagrams represent segments of corresponding average total cost curves which would be computed from the data resulting from variation throughout the entire range of possible output.

Curves having a positive slope can be thought of as being on the portion of the average total cost curve beyond the minimum. Curves having a negative slope have not yet reached their minimum. The results of other empirical studies<sup>1</sup> indicate that the typical average total cost curve declines rapidly as output increases, then is near a minimum over some wide range of output. The presumption follows that if output were pushed beyond capacity, there would be a sharp rise in the cost curve.

In Figure VI-5, all the segments except 500 and over for the period 1953-1960 are on the rising portion of the curves. This situation seems

---

<sup>1</sup>Spencer and Siegelman, p. 333.  
J. Johnston, p. 70.  
Joel Dean, pp. 292-296.

to indicate that for the industry as a whole, minimum costs are reached at some rate of occupancy well under maximum possible occupancy. For example, under 25 beds minimum costs are reached at less than 50 per cent occupancy. The minimum possible occupancy percentage at which minimum costs could occur rises progressively through the larger size categories until it is in excess of 76 per cent for hospitals in the 300-499 size. The mildly negative slope of the 500 and over size indicates that minimum costs are reached at an occupancy per cent in excess of 84.

During 1946-1952, the negative slopes of the curves for the two smallest categories indicate that minimum costs were reached at respective occupancy levels in excess of 62 and 72 per cent. For the largest sizes, the slopes are positive, hence the minima occurred at less than 72 per cent occupancy in each case.

Only the 50-99 size category is comparable directly throughout both the time periods. A direct comparison of the scatter diagrams and the graphs of the regression equations for the two periods for this size class indicates that an upward shift in the cost curve occurred.

The other cost curves seem to corroborate the inference that a shift upward occurred in the cost curves. The tendency seems reasonable in view of the fact that if two points are chosen on the abscissa and equations are graphed within these limits, one graph will be completely above the other throughout the interval unless the graphs intersect. In the following diagram, curve I lies completely above curve II within the limits "a" and "b."

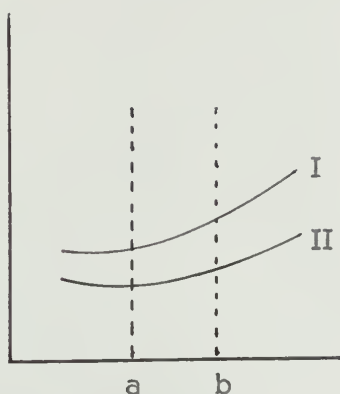


Figure VI-6.—Hypothetical Curves Within Specified Limits

Thus, limits that are common to the diagrams for both sets of years may be chosen for a given size and compared. For example, for the 100-199 class within the limits 70 per cent to 74 per cent, patient-day costs rise from about \$9 to approximately \$11. The corresponding costs in the 100-249 size are from about \$7 to \$7.80. This situation is generally true for the costs in the latter years as compared with the earlier years of this study.

Part of the shift in costs may have been caused by greater homogeneity of costs in the last half of the study. Other causes may have been changes in the underlying production function<sup>1</sup> and incomplete rectification of data

---

<sup>1</sup>Accreditation is often thought to increase costs. And, the fact that hospitals increasingly gained accreditation may partially account for the shifts in the cost curves. It is not possible to state unequivocally that increased accreditation caused cost shifts for two reasons. First, data on the number of hospitals accredited were available only for the years 1953-1960. And the percentage increase in number of hospitals accredited was small in the majority of size categories. See Table III-6. Second, in Figure VI-5, the cost curve was negatively sloped in the under 50 size for 1946-1952, but it was positive in about the same occupancy percentage range for the under 25 and 25-49 sizes for 1953-1960. Almost none of



for extraneous influences. Whatever the causes, there does appear to have been a shift of the short-run curves.

If it is assumed that there were continuous changes over time, one may adjust for such change without regard to the "t" value for the time variable in the multiple regression coefficient. Such adjustment is made in Appendix VI, Figure VI-A for all size categories. Thus, it appears that there was a general upward shift in the cost curves between the two time periods.

Although not much can be said about the long-run cost curve, it appears that, for the hospital industry, it takes the usual "U" shape of economic theory. Such a conclusion seems plausible if it is assumed that the short-run cost curves are relatively flat for some range about their minima and then rise increasingly rapidly upon further departure from the minima. Thus, the linear approximation having the largest coefficient for the independent variable would be the farthest from a minimum value. Inasmuch as the linear segment in Figure VI-4, for the 100-199 size has the steepest slope and the lowest value in its range is one of the lowest values for all segments, it appears that the long-run minimum may be found in this size group. However, the data for all five sizes between 25 and 499 suggest that the long-run curve may be relatively flat throughout much of its range.

---

these hospitals are accredited, yet their group cost curves shifted almost in the same manner as did those for the other groups.

### Summary

Rectifications of the basic cost data -- total cost per patient-day -- have been made to eliminate the influences of price level changes, technological changes and the changes in patient load and severity. Simple linear equations were fitted to the rectified data. The equations were graphed for each size class for the two time periods involved in this study. The equations and graphs indicate that (1) the short-run cost curves shifted upward, (2) that the long-run minimum cost may be found within the 100-199 size category, and (3) that costs generally increased sharply at an occupancy percentage well under maximum capacity.

## CHAPTER VII

### Summary of Findings and Implications for Management

#### Findings Which Support Hypothesis

The working hypothesis under which this study was conducted can be stated to be that the changes in price of hospital care between 1946 and 1960 are explained by a shift in the demand curve for hospital care and by a shift in the related cost curve for providing such care.

Whether measured in patient-days or admissions, demand appears to have shifted. The equation of the demand curve for 1946-1952 is  $Y = 733.6875 - 7.1349X$ .  $Y$  represents the ratio patient-days expense/per cent of population having hospital insurance (median income).  $X$  is defined as patient-days per 100 population. For the period 1953-1960, the equation became  $Y = 147.1757 - 0.65083X$ . Using the same definition for  $Y$  but with  $X$  defined as admissions per 100 population, the equations for the two periods become  $Y = 334.7 - 21.4X$  and  $Y = 130.54 - 3.67X$ . Thus, whether quantity is measured in terms of admissions or patient-days, the linear curves suggest a shift. The quadratic fit also suggests some shift.

Although there is some evidence that demand shifted, it is not possible to say what the effect on hospital prices has been except in the general sense that as quantity of hospital care increased, it was purchased at higher prices than would have prevailed under the former schedule. The



assumption is implicit that no change in the cost function occurred. But, the fact that there may have been a change in costs is the reason that no statement can be made about the precise effects of demand shifts on prices.

But even though little can be said about the effects of the shift, factors which influence demand can be cited and some statement as to their relative magnitudes can be made.

Using data adjusted for price level changes, a multiple regression equation is obtained as follows:

$$X_{1.2345} = -12,221.3744 + 271.57172X_{12.345} - 23.405957X_{13.245} + 0.22281942X_{14.235} + 15.39264X_{15.234}$$

in which:  $X_{1.2345}$  - total expenditures for hospital care in constant dollars (1947-49 = 100)

$X_{12.345}$  - population per square mile

$X_{13.245}$  - per cent of population having hospital insurance

$X_{14.235}$  - median income in constant dollars (1947-49 = 100)

$X_{15.234}$  - employment (in millions)

The corrected standard error of estimate for this equation is 36.4361 millions of dollars. This is a small error when predicting total expenditures in excess of \$4 billion. In fact, the equation has  $R^2 = .9989$  which means that the independent variables explain 99.89 per cent of the variation in total expenditures for hospital care.

The relative magnitudes of the independent variables may be summarized through a comparison of their beta coefficients. In the following table, the

comparisons are made by reading across in each row. Thus,  $B_2$  is 3.6 times larger than  $B_3$ , 10.3 times larger than  $B_4$  and 18.8 times larger than  $B_5$ . The following two rows are read in a similar fashion. It is apparent that population changes are the most important in causing demand changes. Per cent of population having hospital insurance and median income follow in the order given. Employment is of small influence in causing change. This may be because the effects of employment are probably included in the median income effects.

TABLE VII-1.-Relative size of next higher numbered beta

	$B_3$	$B_4$	$B_5$
$B_2$	3.6	10.3	18.8
$B_3$		2.8	5.2
$B_4$			1.8

While the findings with respect to cost changes are not so clear as those involving demand, there seems to be sufficient evidence to support the conclusion that costs increased in a functional sense. There is a suggestion of such an increase in Tables VI-5 and VI-6 in which adjusted constant dollar costs per patient-day are shown for each size category. Although there was variation in the costs among the categories, the costs for any given size varied from approximately \$6 to about \$10 for the period 1946-1952. For 1953-1960, however, the costs varied in the range of about \$9.20 to \$11.50.

The scatter diagrams of Figures VI-4 and VI-5 also confirm the conclusion. Making the assumption that the curve fitted to the points for each size is a segment of the usual "U" shaped average total cost curve, one may see that, for a given occupancy percentage, the comparable, or nearly comparable, curve is at a higher level for 1953-1960 than for the 1946-1952 period.

To be strictly comparable, the sizes for which the curves in the two periods are compared would have to be identical. Such a comparison was available only in the 50-99 category which was the same throughout the 15 years. An additional condition required is for the slopes to be identical in the two time periods. Such a condition did not exist. Thus, it is not possible to say without equivocation that the cost curve shifted. However, some of the slopes are nearly the same. Specifically, the slopes of the curves for the 100-199, 200-249 and 300-499 are similar in direction to the slope of the 100-249 curve. The first three vary between approximately 0.41 and 0.50 while the last has a slope of 0.23. Likewise, the 500 and over slope of -0.014 is not much different from the 0.012 of the 250 and over slope.

#### Findings Unfavorable to Hypothesis

As the foregoing paragraphs suggest, no definite statement can be made as to changes in the cost curves. Perhaps, rather than characterizing the following discussion as concerning findings which negate the hypothesis, it may be more appropriate to think of it as a summary of limitations of the positive findings.



In Figure VI-5, the slopes of the curves for the under 50 and the 50-99 sizes are negative, while for the three categories for the latter period -- under 25, 25-49, 50-99 -- they are positive. Inasmuch as the associated occupancy percentages are larger in the early period, one may infer that not only did the level of the curves shift, but also their shapes changed as well. Thus, minima are found associated with small occupancy percentages during the latter period.

If one thinks of the long-run average total cost curve enveloping the short-run curves of the 1946-1952 period, he may visualize a curve that declines rapidly at first then flattens out and begins a gentle rise in the 250 and over size. The difficulty with such a picture is that the slope of the 100-249 curve is steeper than that of 250 and over. The implication is that the 100-249 size operated at an occupancy percentage beyond the minimum cost level or that the 250 and over category failed to reach the most economical occupancy percentage.

The statements in the preceding paragraph are based on the assumption of a continuous planning curve. In view of the discontinuities of existing size, one may infer that for the given volume of care needed, the segments of the curves represent minimum costs.

It is difficult to make any similar statements about the long-run cost curves for the latter period. About the most that can be said is that there may be some tendency for long-run minimum costs to be achieved somewhere in the 50-99 or 100-199 categories. Because of the level of the cost curves and the steepness of the slopes, it seems more reasonable to think that

minimum costs may occur in the 100-199 size than in any other size.

The limitations concerning demand center around the fact that demand for the entire industry is dealt with. For management purposes, it would be useful to know something about the demand facing each hospital or type of hospital. Thus, one might find significant differences among the demand schedules facing hospitals classified according to ownership, or size, or location.

Likewise, it would be useful to know something about the influence on demand of the changing structure of population. Changes in total population are dealt with in this study. However, it may be worthwhile to know something about how changes involving age, race, sex and marital status affect demand.

Also, there could probably have been some useful information obtained by using more detailed information concerning the nature and extent of hospital insurance coverage.

These limitations may be subsumed under a listing of topics into which additional research would yield worthwhile information. Such a list follows.

#### Topics Requiring Additional Research

1. An acuity index needs to be developed to enable one to allow for the changing composition of the patient load in studies of costs. It may be necessary, depending upon the type of studies being made, to develop

such an index at the individual hospital level as well as various aggregative levels -- regional or national.

2. Additional studies to find cost functions for individual hospitals would be useful for many purposes. Some specific purposes might include ascertaining the differences in the minimum cost among the various sizes, types of control, service and location. Also, it would be useful to find the occupancy percentage at which minimum cost is attained.

3. Corollary to the study of the short-run costs, would be studies to ascertain more about the nature of long-run costs.

4. In order to conduct studies which predict the short-run hospital cost structure at some future time, it is necessary to know something about the rate of technological change. There seems to be very little information available concerning how rapidly technology is changing in the hospital field or how quickly technological changes are implemented among the nation's hospitals. Studies for the purpose of determining how technological change occurs and its rate would be useful.

5. More detailed studies on demand are needed. These studies could include such factors as the composition of the population by age, race, sex and marital status. Also, the effects of the nature and extent of insurance coverage -- including insurance or aid provided by government -- on demand should be studied in greater depth.

6. One of the weaknesses of the present study lies in the limited number of observations available. If some way could be found by which the presently included data could be broken into their monthly or weekly



components, they would probably reveal more useful information. In any future study similar to the present one or any study of the topics suggested above, it will be necessary to obtain additional and more detailed data than are included in this study or are presently available.

### Implications for Management

The Commission on Financing of Hospital Care reported that "the rise in general hospital expenditures from 1935-1952 was due almost entirely to external forces beyond the control of hospital management. The most important of these were economic inflation, increase in population, and increase in the proportion of population seeking hospital care."<sup>1</sup> In general, the same situation prevailed in the years 1946-1960. However, even though the causes of increase in costs may not have been under the direct control of hospital management, management is not totally helpless in coping with the causes. Some action may be taken by hospitals individually: in some situations action will be required by hospitals acting jointly. The findings of this study have implications for both types of situations. The joint implications will be considered first.

First, the long-term trend of increasing population and probable increasing hospital insurance coverage -- both in percentage covered and broadened coverage -- along with upward movement of income suggests

---

<sup>1</sup>John H. Hayes, (ed.) Factors Affecting the Costs of Hospital Care, Vol. I of the Report of The Commission on Financing of Hospital Care in the United States (3 vols.; New York: The Blakiston Co., Inc., 1954), p. 38.

that demand for hospital care may be expected to increase. Increasing strain will be placed upon existing hospital facilities and personnel. Thus, continuing efforts will be required to maintain and expand the nation's hospitals. Especially in metropolitan areas, joint action in determining the area's needs and providing the resources for satisfying those needs will be required.

Likewise, a similar problem exists with respect to hospital personnel. Just to keep pace with the expanding population would require an increase of about 2 per cent annually in hospital employees. In view of the increasing number of employees required per patient, it is evident that an increase well above 2 per cent will be required. Particularly where trained employees are required, there will be increasing demands made upon the industry's training facilities -- schools of medicine, nursing, et cetera. If it is to assure itself an adequate supply of competent employees, the hospital industry may have to accept the responsibility of fostering the expansion of training facilities. Also, some type of recruiting program of an industry-wide character may be required.

The expansion and recruiting programs may be especially important in some areas. Unlike the situation described in economic models in which relatively complete information and perfect mobility of factors is assumed, there may be lack of knowledge on the part of prospective trainees or employees concerning the opportunities available other than in their own immediate areas. Likewise, a similar lack of knowledge concerning employees may exist among the hospitals. But perhaps even more serious

may be the lack of mobility, especially among nurses since they may not be the primary income earner in the family. In such cases, if their spouses are committed to a career in a given area, there may be lack of mobility among nurses except into or out of the labor force within the given area regardless of opportunities elsewhere.

Some prediction of the demand which the hospital industry could expect to face could be made by inserting estimates of a given year's population, percentage of insurance coverage, median income and population in the predicting equation of chapter five or some similar equation.

The second point having industry-wide implications involves the amount of increase in costs. When patient-day costs are adjusted for price level changes and changes in the complexity of care received, the remaining increase is only a small percentage of the unadjusted price increases. In view of the widespread interest in hospital costs cited in chapter one, it appears that an institutional advertising program may be indicated to educate the public to the fact that cost increases as reflected in current dollars are more apparent than real. Although such a program could be undertaken by any hospital, the effects would probably be more significant if the program were sponsored by the American Hospital Association, Blue Cross or some similar spokesman for the entire industry.

The strong demand situation facing the industry has implications also for the management of any given hospital. First, in such a situation, it becomes easy to bid up the factors of production. This is apparently what happened, at least to some extent, between 1946 and 1960 for labor. It



may have happened for other factors as well. But hospital employees' wages increased by a larger percentage than did wages generally. Even after adjustment for price level changes and number of employees, the cost curves moved upward. It would seem that some of the movement upward may have been accounted for by the movement of hospital wages above the general wage level. Part of the increase in hospital wages may have come from an increase in the use of larger numbers of more highly skilled and hence highly paid employees.

The merits of the wage increases are not at issue here. But what is important is that the hospital administrator recognize that the bidding up of factors may be of serious consequence in the continuing operation of his hospital. Even though he may be unable to avoid the situation, he will be enabled to adapt to it more easily than if he did not recognize it at all.

Second, if elasticity has increased, the implication is that the quantities of hospital care purchased are influenced by prices. Thus, in a hospital's pricing policy, price changes may have depressing effects on the quantity of service sold. Knowledge of this situation may be applied either in rationing limited facilities or in expanding use of facilities where they may not be used to capacity.

The fact that costs increased means that the administration of a hospital should be alert to the possibilities of reducing costs or holding costs to their present level wherever it is possible to do so while at the same time maintaining an adequate quality of medical care. In order to control costs, it is necessary that they be known. This probably means that increased attention may have to be given to determining the costs of care according to type of illness. Thus if there should be an increase in illnesses which are costly to treat, it is only to be expected that total costs for conducting the hospital's business would increase. The reverse situation should prevail if less severe illnesses comprised the major part of the cases hospitalized. But even in view of these expected cost changes, the administrator would have factual information to present to the medical staff upon whom he would have to rely for the largest part of any cost control program.

Finally, the cost curves of chapter six suggest that size of hospital is relatively unimportant in achieving least cost care. That is, if a community's hospital needs can be satisfied with a certain type of facilities, there may be very little difference in the cost per patient-day of providing the care regardless of size within the range of from 50-499 beds. Thus, once it is determined what types of facilities will serve the medical needs of an area, there is room for other considerations -- such as proximity to patients' homes, physicians' offices, et cetera -- in determining the size of the facility to be built. The important consideration is to make sure that adequate facilities are provided to care for the types of medical demands which exist in the community.

## APPENDIX I



TABLE I-A.-Estimates of the total resident population (in thousands) of the United States by age on July 1, 1946-1960, inclusive<sup>a</sup>

(Figures include military personnel stationed in the United States, but exclude those stationed outside the United States. All figures have been rounded to the nearest thousand; therefore, the sums of parts may differ from the totals.)

Year	Total	Under 15	15-24	25-34	35-44	45-54	55-64	65 & over
Number of people								
1946	140,054	35,088	22,368	22,697	20,025	16,807	12,242	10,828
1947	143,446	36,663	22,655	23,077	20,376	16,962	12,526	11,185
1948	146,093	38,008	22,548	23,329	20,748	17,099	12,823	11,538
1949	148,665	39,377	22,244	23,580	21,148	17,252	13,144	11,921
1950	150,697	40,483	22,099	23,759	21,450	17,342	13,369	12,194
1951	153,383	42,269	21,494	23,815	21,821	17,673	13,573	12,737
1952	155,767	43,837	21,101	23,906	22,073	17,943	13,807	13,101
1953	158,305	45,423	21,050	23,945	22,251	18,220	14,092	13,324
1954	161,191	47,079	21,067	23,972	22,495	18,548	14,332	13,698
1955	164,303	48,798	21,339	23,915	22,738	18,897	14,547	14,069
1956	167,261	50,474	21,571	23,787	22,988	19,283	14,752	14,406
1957	170,295	52,131	22,014	23,532	23,227	19,691	14,951	14,750
1958	173,232	53,410	22,919	23,181	23,450	20,088	15,138	15,046
1959	176,365	54,927	23,701	22,843	23,678	20,479	15,358	15,379
1960	179,984	56,092	24,178	22,745	24,120	20,563	15,627	16,657
Per cent of population								
1946		25.1	16.0	16.2	14.3	12.0	8.7	7.7
1947		25.6	15.8	16.1	14.2	11.8	8.7	7.8
1948		26.0	15.4	16.0	14.2	11.7	8.8	7.9
1949		26.5	15.0	15.9	14.2	11.6	8.8	8.0
1950		26.9	14.7	15.8	14.2	11.5	8.9	8.1
1951		27.6	14.0	15.5	14.2	11.5	8.8	8.3
1952		28.1	13.5	15.3	14.2	11.5	8.9	8.4
1953		28.7	13.3	15.1	14.1	11.5	8.9	8.4
1954		29.2	13.1	14.9	14.0	11.5	8.9	8.5
1955		29.7	13.0	14.6	13.8	11.5	8.9	8.6
1956		30.2	12.9	14.2	13.7	11.5	8.8	8.6
1957		30.6	12.9	13.8	13.6	11.6	8.8	8.7
1958		30.8	13.2	13.4	13.5	11.6	8.7	8.7
1959		31.1	13.4	13.0	13.4	11.6	8.7	8.7
1960		31.2	13.4	12.6	13.4	11.4	8.7	9.3

TABLE I-A.-Continued

Year	Total	Under 15	15-24	25-34	35-44	45-54	55-64	65 & over
Per cent change from 1946								
1946	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1947	2.4	4.5	1.3	1.7	1.8	0.9	2.3	3.3
1948	4.3	8.3	0.8	2.8	3.6	1.7	4.7	6.6
1949	6.1	12.2	-0.6	3.9	5.6	2.6	7.4	10.1
1950	7.6	15.4	-1.2	4.7	7.1	3.2	9.2	12.6
1951	9.5	20.5	-3.9	4.9	9.0	5.2	10.9	17.6
1952	11.2	24.9	-5.7	5.3	10.2	6.8	12.8	21.0
1953	13.0	29.5	-5.9	5.5	11.1	8.4	15.1	23.1
1954	15.1	34.2	-5.8	5.6	12.3	10.4	17.1	26.5
1955	17.3	39.1	-4.6	5.4	13.5	12.4	18.8	29.9
1956	19.4	43.8	-3.6	4.8	14.8	14.7	20.5	33.0
1957	21.6	48.6	-1.6	3.7	16.0	17.2	22.1	36.2
1958	23.7	52.2	2.5	2.1	17.1	19.5	23.7	39.0
1959	25.9	56.5	6.0	0.6	18.2	21.8	25.5	42.0
1960	28.5	59.9	8.1	0.2	20.4	22.3	27.7	53.8
Per cent change from year to year								
1946	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1947	2.4	4.5	1.3	1.7	1.8	0.9	2.3	3.3
1948	1.8	3.7	-0.5	1.1	1.8	0.8	2.4	3.2
1949	1.8	3.6	-1.3	1.1	1.9	0.9	2.5	3.3
1950	1.4	2.8	-0.7	0.8	1.4	0.5	1.7	2.3
1951	1.8	4.4	-2.7	0.2	1.7	1.9	1.5	4.5
1952	1.6	3.7	-1.8	0.4	1.2	1.5	1.7	2.9
1953	1.6	3.6	-0.2	0.2	0.8	1.5	2.1	1.7
1954	1.8	3.6	0.1	0.1	1.1	1.8	1.7	2.8
1955	1.9	3.7	1.3	-0.2	1.1	1.9	1.5	2.7
1956	1.8	3.4	1.1	-0.5	1.1	2.0	1.4	2.4
1957	1.8	3.3	2.1	-1.1	1.0	2.1	1.3	2.4
1958	1.7	2.5	4.1	-1.5	1.0	2.0	1.3	2.0
1959	1.8	2.8	3.4	-1.5	1.0	1.9	1.5	2.2
1960	2.1	2.1	2.0	-0.4	1.9	0.4	1.8	8.3

<sup>a</sup>Calculated from: U. S. Department of Commerce, Bureau of the Census, Current Population Reports, Population Estimates (Washington: Government Printing Office), Series P-25, Nos. 73, 93, 98, 101, 121, 146, 170, 193, 212, 246.



TABLE I-B.-Estimates of the total resident population (in thousands) of the United States by age on July 1, 1946-1960, inclusive<sup>a</sup>

(Figures include military personnel stationed in the United States, but exclude those stationed outside the United States. All figures have been rounded to the nearest thousand; therefore, the sum of parts may differ from the totals.)

Year	Total	Under 20	20-34	35-64	65 & over
Number of people					
1946	140,054	45,982	34,171	49,074	10,828
1947	143,446	47,703	34,692	49,864	11,185
1948	146,093	48,949	34,936	50,670	11,538
1949	148,665	50,104	35,097	51,544	11,921
1950	150,897	51,100	35,241	52,086	12,270
1951	153,384	52,763	34,819	53,157	12,644
1952	155,761	54,382	34,488	53,887	12,996
1953	158,313	56,133	34,266	54,580	13,333
1954	161,191	57,995	34,224	55,375	13,698
1955	164,303	59,827	34,225	56,182	14,069
1956	167,261	61,737	34,095	56,990	14,406
1957	170,295	63,796	33,881	57,869	14,750
1958	173,232	65,773	33,737	58,676	15,046
1959	176,365	67,774	33,697	59,515	15,379
1960	179,984	69,400	33,615	60,310	16,657
Per cent of population					
1946		32.8	24.4	35.0	7.7
1947		33.3	24.2	34.8	7.8
1948		33.5	23.9	34.7	7.9
1949		33.7	23.6	34.7	8.0
1950		33.9	23.4	34.6	8.1
1951		34.4	22.7	34.7	8.2
1952		34.9	22.1	34.6	8.3
1953		35.5	21.6	34.5	8.4
1954		36.0	21.2	34.4	8.5
1955		36.4	20.8	34.2	8.6
1956		36.9	20.4	34.1	8.6
1957		37.5	19.9	34.0	8.7
1958		38.0	19.5	33.9	8.7
1959		38.4	19.1	33.7	8.7
1960		38.6	18.7	33.5	9.3



TABLE I-B.-Continued

Year	Total	Under 20	20-34	35-64	65 & over
Per cent change from 1946					
1946	0.0	0.0	0.0	0.0	0.0
1947	2.4	3.7	1.5	1.6	3.3
1948	4.3	6.5	2.2	3.3	6.6
1949	6.1	9.0	2.7	5.0	10.1
1950	7.6	11.1	3.1	6.1	13.3
1951	9.5	14.7	1.9	8.3	16.8
1952	11.2	18.3	0.9	9.8	20.0
1953	13.0	22.1	0.3	11.2	23.1
1954	15.1	26.1	0.2	12.8	26.5
1955	17.3	30.1	0.2	14.5	29.9
1956	19.4	34.3	-0.2	16.1	33.0
1957	21.6	38.7	-0.8	17.9	36.2
1958	23.7	43.0	-1.3	19.6	39.0
1959	25.9	47.4	-1.4	21.3	42.0
1960	28.5	50.9	-1.6	22.9	53.8
Per cent change from year to year					
1946	0.0	0.0	0.0	0.0	0.0
1947	2.4	3.7	1.5	1.6	3.3
1948	1.8	2.6	0.7	1.6	3.2
1949	1.8	2.4	0.5	1.7	3.3
1950	1.4	2.0	0.4	1.1	2.9
1951	1.8	3.3	-1.2	2.1	3.0
1952	1.6	3.1	-1.0	1.4	2.8
1953	1.6	3.3	-0.6	1.3	2.6
1954	1.8	3.2	-0.1	1.5	2.7
1955	1.9	3.2	0.0	1.5	2.7
1956	1.8	3.2	-0.4	1.4	2.4
1957	1.8	3.3	-0.6	1.5	2.4
1958	1.7	3.1	-0.4	1.4	2.0
1959	1.8	3.0	-0.1	1.4	2.2
1960	2.1	2.4	-0.2	1.3	8.3

<sup>a</sup>Calculated from: U. S. Department of Commerce, Bureau of the Census, Current Population Reports, Population Estimates (Washington: Government Printing Office), Series P-25, Nos. 73, 93, 98, 101, 121, 146, 170, 193, 212, 246.

TABLE I-C.-Estimated total population (in thousands), and per cent distribution by race as of July 1, 1946-1960, inclusive<sup>a</sup>

(Figures include military personnel stationed outside the United States.)

Year		Total	White	Non-white
Number of people				
1946	1946	141,389	126,565	14,824
	1947	144,126	129,059	15,067
	1948	146,631	131,308	15,323
	1949	149,188	133,598	15,590
	1950	151,683	135,818	15,865
	1951	154,360	138,120	16,241
	1952	157,028	140,412	16,616
	1953	159,636	142,633	17,003
	1954	162,417	144,995	17,423
	1955	165,270	147,406	17,864
	1956	168,176	149,853	18,323
	1957	171,198	152,388	18,810
	1958	174,054	154,771	19,283
	1959	177,103	157,290	19,813
	1960	179,323	158,832	20,491
Per cent of population				
	1946		89.5	10.5
	1947		89.5	10.5
	1948		89.5	10.5
	1949		89.6	10.4
	1950		89.5	10.5
	1951		89.5	10.5
	1952		89.4	10.6
	1953		89.3	10.7
	1954		89.3	10.7
	1955		89.2	10.8
	1956		89.1	10.9
	1957		89.0	11.0
	1958		88.9	11.1
	1959		88.8	11.2
	1960		88.6	11.4

TABLE I-C.-Continued

Year	Total	White	Non-white
Per cent change from 1946			
1946	0.0	0.0	0.0
1947	1.9	2.0	1.6
1948	3.7	3.7	3.4
1949	5.5	5.6	5.2
1950	7.3	7.3	7.0
1951	9.2	9.1	9.6
1952	11.1	10.9	12.1
1953	12.9	12.7	14.7
1954	14.9	14.6	17.5
1955	16.9	16.5	20.5
1956	18.9	18.4	23.6
1957	21.1	20.4	26.9
1958	23.1	22.3	30.1
1959	25.3	24.3	33.7
1960	26.8	25.5	38.2
Yearly per cent change			
1946	0.0	0.0	0.0
1947	1.9	2.0	1.6
1948	1.7	1.7	1.7
1949	1.7	1.7	1.7
1950	1.7	1.7	1.8
1951	1.8	1.7	2.4
1952	1.7	1.7	2.3
1953	1.7	1.6	2.3
1954	1.7	1.7	2.5
1955	1.8	1.7	2.5
1956	1.8	1.7	2.6
1957	1.8	1.7	2.7
1958	1.7	1.6	2.5
1959	1.8	1.6	2.7
1960	1.3	1.0	3.4

<sup>a</sup>Source: Figures for 1946-1949 and 1951 taken from U. S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1957 (Washington: 1960), p. 8; Figures for 1950, 1952-1959 are from U. S. Bureau of the Census, Statistical Abstract of the United States: 1960. (81st ed.; Washington: 1960), p. 22; Figures for 1960 are from U. S. Bureau of the Census, Statistical Abstract of the United States: 1961. (82nd ed.; Washington: 1960), p. 26.



TABLE I-D.-Estimates of the total population (in thousands) of the United States, by sex, on July 1, 1946-1960, inclusive<sup>a</sup>

Year	Total	Male	Female
Number of people			
1946	141,389	70,631	70,757
1947	144,126	71,946	72,180
1948	146,631	73,130	73,502
1949	149,188	74,335	74,853
1950	151,326	75,187	76,139
1951	154,360	76,825	77,536
1952	157,027	78,104	78,923
1953	159,636	79,337	80,299
1954	162,417	80,656	81,761
1955	165,270	82,016	83,254
1956	168,176	83,400	84,776
1957	171,198	84,847	86,351
1958	174,053	86,195	87,858
1959	177,103	87,651	89,452
1960	179,323	88,331	90,992
Per cent of population			
1946		50.0	50.0
1947		49.9	50.1
1948		49.9	50.1
1949		49.8	50.2
1950		49.7	50.3
1951		49.8	50.2
1952		49.7	50.3
1953		49.7	50.3
1954		49.7	50.3
1955		49.6	50.4
1956		49.6	50.4
1957		49.6	50.4
1958		49.5	50.5
1959		49.5	50.5
1960		49.3	50.7

TABLE I-D.-Continued

Year	Total	Male	Female
Per cent change from 1946			
1946	0.0	0.0	0.0
1947	1.9	1.9	2.0
1948	3.7	3.5	3.9
1949	5.5	5.2	5.8
1950	7.3	6.5	7.6
1951	9.2	8.8	9.6
1952	11.1	10.6	11.5
1953	12.9	12.3	13.5
1954	14.9	14.2	15.6
1955	16.9	16.1	17.7
1956	18.9	18.1	19.8
1957	21.1	20.1	22.0
1958	23.1	22.0	24.2
1959	25.3	24.1	26.4
1960	26.8	25.1	28.6
Per cent change from year to year			
1946	0.0	0.0	0.0
1947	1.9	1.9	2.0
1948	1.7	1.6	1.8
1949	1.7	1.6	1.8
1950	1.7	1.1	1.7
1951	1.8	2.2	1.8
1952	1.7	1.7	1.8
1953	1.7	1.6	1.7
1954	1.7	1.7	1.8
1955	1.8	1.7	1.8
1956	1.8	1.7	1.8
1957	1.8	1.7	1.9
1958	1.7	1.6	1.7
1959	1.8	1.7	1.8
1960	1.3	1.8	1.7

<sup>a</sup>Source: Figures for 1946-1948 and 1951 are taken from U. S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1957 (Washington: 1960), p. 8; Figures for 1950, 1952-1959 are from U. S. Bureau of the Census, Statistical Abstract of the United States: 1960. (81 st ed.; Washington: 1960), p. 22; 1960 figures are from U. S. Bureau of the Census, Statistical Abstract of the United States: 1961 (82nd ed.; Washington: 1960), p. 27.

TABLE I-E.-Estimates of resident population (in thousands) by age, sex and race as of July 1, 1946-1960, inclusive<sup>a</sup>

(Figures include military personnel in the United States, but exclude those stationed outside the United States. All figures have been rounded to the nearest thousand; therefore, the sum of parts may differ from the totals.)

Year	Race	Total pop	Male				Total
			Under 20	20-34	35-64	65 & over	
1946	White	125,327	20,177	14,798	22,258	4,824	62,056
	Non-wh	14,727	2,845	1,765	2,264	374	7,249
1947	White	128,428	21,162	15,170	22,582	4,968	63,881
	Non-wh	15,018	2,927	1,778	2,299	386	7,390
1948	White	130,810	21,794	15,278	22,908	5,108	65,087
	Non-wh	15,283	2,998	1,785	2,331	394	7,507
1949	White	133,115	22,318	15,342	23,280	5,258	66,197
	Non-wh	15,549	3,071	1,775	2,368	401	7,617
1950	White	134,942	22,790	15,434	23,540	5,360	67,129
	Non-wh	15,755	3,133	1,770	2,395	408	7,704
1951	White	137,229	23,482	15,060	23,910	5,533	67,984
	Non-wh	16,154	3,280	1,743	2,426	421	7,870
1952	White	139,254	24,196	14,780	24,169	5,670	68,816
	Non-wh	16,507	3,407	1,738	2,451	433	8,029
1953	White	141,444	24,970	14,673	24,352	5,797	69,833
	Non-wh	16,369	3,545	1,731	2,471	441	8,189
1954	White	143,386	25,767	14,631	24,699	5,932	71,030
	Non-wh	17,304	3,703	1,751	2,499	453	8,406
1955	White	146,536	26,546	14,791	25,004	6,064	72,406
	Non-wh	17,767	3,852	1,800	2,534	463	8,648
1956	White	149,015	27,348	14,763	25,320	6,179	73,608
	Non-wh	18,246	4,023	1,819	2,569	471	8,883
1957	White	151,560	28,230	14,679	25,633	6,287	74,829
	Non-wh	18,735	4,203	1,827	2,609	481	9,120
1958	White	154,008	29,083	14,632	25,929	6,371	76,013
	Non-wh	19,224	4,378	1,853	2,647	486	9,365
1959	White	156,606	29,926	14,647	26,246	6,472	77,289
	Non-wh	19,759	4,564	1,878	2,691	495	9,628
1960	White	159,381	30,509	14,580	26,590	6,938	78,617
	Non-wh	20,603	4,684	1,866	2,867	598	10,017

<sup>a</sup>Calculated from: U. S. Department of Commerce, Bureau of the Census, Current Population Reports, Population Estimates (Washington: U. S. Government Printing Office), Series P-25, Nos. 73, 83, 98, 101, 121, 146, 170, 193, 212, 246.



TABLE I-E.-Continued

Female				
Under 20	20-34	35-64	65 & over	Total
20,048	15,680	22,284	5,260	63,271
2,914	1,928	2,270	368	7,480
20,643	15,795	22,261	5,451	64,547
2,974	1,950	2,323	383	7,628
21,125	15,900	23,053	5,645	65,723
3,032	1,974	2,376	394	7,776
21,613	15,985	23,464	5,855	66,918
3,103	1,995	2,430	306	7,932
22,016	16,027	23,756	6,014	67,813
3,161	2,011	2,466	413	8,051
22,697	15,998	24,294	6,258	69,245
3,304	2,018	2,529	432	8,284
23,355	15,939	24,701	6,446	70,438
3,424	2,031	2,576	446	8,478
24,061	15,822	25,095	6,633	71,611
3,557	2,040	2,621	461	8,679
24,819	15,695	25,506	6,838	72,856
3,704	2,046	2,670	477	8,898
25,578	15,581	25,923	7,049	74,130
3,852	2,053	2,723	493	9,119
26,346	15,458	26,354	7,248	75,407
4,020	2,056	2,780	509	9,364
27,172	15,315	26,789	7,456	76,731
4,192	2,060	2,839	524	9,615
27,954	15,187	27,203	7,649	77,995
4,359	2,065	2,896	538	9,859
28,745	15,096	27,620	7,859	79,318
4,541	2,076	2,959	555	10,131
29,505	15,027	27,775	8,456	80,764
4,702	2,140	3,078	666	10,586

TABLE I-F.-Per cent distribution of estimates of resident population by age, sex and race (including military forces stationed in the United States but excluding those stationed outside the United States) as of July 1, 1946-1960, inclusive<sup>a</sup>

Year	Race	Total	Male				Total
			Under 20	20-34	35-64	65 & over	
1946	White	89.5	14.4	10.6	15.9	3.4	44.3
	Non-wh	10.5	2.0	1.3	1.6	0.3	5.2
1947	White	89.5	14.8	10.6	15.7	3.5	44.5
	Non-wh	10.5	2.0	1.2	1.6	0.3	5.2
1948	White	89.5	14.9	10.5	15.7	3.5	44.6
	Non-wh	10.5	2.1	1.2	1.6	0.3	5.1
1949	White	89.5	15.0	10.3	15.7	3.5	44.5
	Non-wh	10.5	2.1	1.2	1.6	0.3	5.1
1950	White	89.5	15.1	10.2	15.6	3.6	44.5
	Non-wh	10.5	2.1	1.2	1.6	0.3	5.1
1951	White	89.5	15.3	9.8	15.6	3.6	44.3
	Non-wh	10.5	2.1	1.1	1.6	0.3	5.1
1952	White	89.4	15.5	9.5	15.5	3.6	44.2
	Non-wh	10.6	2.2	1.1	1.6	0.3	5.2
1953	White	89.3	15.8	9.3	15.4	3.7	44.1
	Non-wh	10.7	2.2	1.1	1.6	0.3	5.2
1954	White	89.3	16.0	9.1	15.3	3.7	44.1
	Non-wh	10.7	2.3	1.1	1.6	0.3	5.2
1955	White	89.2	16.2	9.0	15.2	3.7	44.1
	Non-wh	10.8	2.3	1.1	1.5	0.3	5.3
1956	White	89.1	16.4	8.8	15.1	3.7	44.0
	Non-wh	10.9	2.4	1.1	1.5	0.3	5.3
1957	White	89.0	16.6	8.6	15.1	3.7	43.9
	Non-wh	11.0	2.5	1.1	1.5	0.3	5.4
1958	White	88.9	16.8	8.4	15.0	3.7	43.9
	Non-wh	11.1	2.5	1.1	1.5	0.3	5.4
1959	White	88.8	17.0	8.3	14.9	3.7	43.8
	Non-wh	11.2	2.6	1.1	1.5	0.3	5.5
1960	White	88.6	17.0	8.1	14.8	3.9	43.7
	Non-wh	11.4	2.6	1.1	1.6	0.3	5.6

<sup>a</sup>Calculated from: U. S. Department of Commerce, Bureau of the Census, Current Population Reports, Population Estimates (Washington: U. S. Government Printing Office), Series P-25, Nos. 73, 93, 98, 101, 121, 146, 170, 193, 212, 246.

TABLE I-F.-Continued

Female				
Under 20	20-34	35-64	65 & over	Total
14.3	11.2	15.9	3.8	45.2
2.1	1.4	1.6	0.3	5.3
14.4	11.0	15.8	3.8	45.0
2.1	1.4	1.6	0.3	5.3
14.5	10.9	15.8	3.9	45.0
2.1	1.4	1.6	0.3	5.3
14.5	10.8	15.8	3.9	45.0
2.1	1.3	1.6	0.2	5.3
14.6	10.6	15.8	4.0	45.0
2.1	1.3	1.6	0.3	5.3
14.8	10.4	15.8	4.1	45.1
2.2	1.3	1.6	0.3	5.4
15.0	10.2	15.9	4.1	45.2
2.2	1.3	1.7	0.3	5.4
15.2	10.0	15.9	4.2	45.2
2.2	1.3	1.7	0.3	5.5
15.4	9.7	15.8	4.2	45.2
2.3	1.3	1.7	0.3	5.5
15.6	9.5	15.8	4.3	45.1
2.3	1.2	1.7	0.3	5.6
15.8	9.2	15.8	4.3	45.1
2.4	1.2	1.7	0.3	5.6
16.0	9.0	15.7	4.4	45.1
2.5	1.2	1.7	0.3	5.6
16.1	8.8	15.7	4.4	45.0
2.5	1.2	1.7	0.3	5.7
16.3	8.6	15.7	4.5	45.0
2.6	1.2	1.7	0.3	5.7
16.4	8.3	15.4	4.7	44.9
2.6	1.2	1.7	0.4	5.9



TABLE I-G.-Per cent change from 1946 in estimates of population by age, sex and race (including military forces stationed in the United States but excluding those stationed outside the United States) as of July 1, 1946-1960, inclusive<sup>a</sup>

Year	Race	Total	Male				Total
			Under 20	20-34	35-64	65 & over	
1946	White	0.0	0.0	0.0	0.0	0.0	0.0
	Non-wh	0.0	0.0	0.0	0.0	0.0	0.0
1947	White	2.5	4.9	2.5	1.5	3.0	2.9
	Non-wh	2.0	2.9	0.7	1.5	3.2	1.9
1948	White	4.4	8.0	3.2	2.9	5.9	4.9
	Non-wh	3.8	5.4	1.1	3.0	5.3	3.6
1949	White	6.2	10.6	3.7	4.6	9.0	6.7
	Non-wh	5.6	7.9	0.6	4.6	7.2	5.1
1950	White	7.7	13.0	4.3	5.8	11.1	8.2
	Non-wh	7.0	10.1	0.3	5.8	9.1	6.3
1951	White	9.5	16.4	1.8	7.4	14.7	9.6
	Non-wh	9.7	15.3	-1.2	7.2	12.6	8.6
1952	White	11.1	19.9	-0.1	8.6	17.5	10.9
	Non-wh	12.1	19.8	-1.5	8.3	15.8	10.8
1953	White	12.9	23.8	-0.8	9.6	20.2	12.5
	Non-wh	14.7	24.6	-1.9	9.1	17.9	13.0
1954	White	14.8	27.7	-1.1	11.0	23.0	14.5
	Non-wh	17.5	30.2	-0.8	10.4	21.1	16.0
1955	White	16.9	31.6	0.0	12.3	25.7	16.7
	Non-wh	20.6	35.4	2.0	11.9	23.8	19.3
1956	White	18.9	35.5	-0.2	13.8	28.1	18.6
	Non-wh	23.9	41.4	3.1	13.5	25.9	22.5
1957	White	20.9	39.9	-0.8	15.2	30.3	20.6
	Non-wh	27.2	47.7	3.5	15.2	28.6	25.8
1958	White	22.9	44.1	-1.1	16.5	32.1	22.5
	Non-wh	30.5	53.9	5.0	16.9	29.9	29.2
1959	White	25.0	48.3	-1.0	17.9	34.2	24.5
	Non-wh	34.2	60.4	6.4	18.9	32.4	32.8
1960	White	27.2	51.2	-1.5	19.5	43.8	26.7
	Non-wh	39.9	64.6	5.7	26.6	59.9	38.2

<sup>a</sup>Calculated from: U. S. Department of Commerce, Bureau of the Census, Current Population Reports, Population Estimates (Washington: U. S. Government Printing Office), Series P-25, Nos. 73, 93, 98, 101, 121, 146, 170, 193, 212, 246.

TABLE I-G.-Continued

Female				
Under 20	20-34	35-64	65 & over	Total
0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0
3.0	0.7	1.7	3.6	2.0
2.1	1.1	2.3	4.1	2.0
5.4	1.4	3.5	7.3	3.9
4.0	2.4	4.7	7.1	4.0
7.8	1.9	5.3	11.3	5.8
6.5	3.5	7.0	10.3	6.0
9.8	2.2	6.6	14.3	7.2
8.5	4.3	8.6	12.2	7.6
13.2	2.0	9.0	19.0	9.4
13.4	4.7	11.4	17.4	10.7
16.5	1.7	10.8	22.5	11.3
17.5	5.3	13.5	21.2	13.3
20.0	0.9	12.6	26.1	13.2
22.1	5.8	15.5	25.3	16.0
23.8	0.1	14.5	30.0	15.1
27.1	6.1	17.6	29.6	19.0
27.6	-0.6	16.3	34.0	17.2
32.2	6.5	20.0	34.0	21.9
31.4	-1.4	18.3	37.8	19.2
38.0	6.6	22.5	38.3	25.2
35.5	-2.3	20.2	41.7	21.3
43.9	6.8	25.1	42.4	28.5
39.4	-3.1	22.1	45.4	23.3
49.6	7.1	27.6	46.2	31.8
43.4	-3.7	23.9	49.4	25.4
55.8	7.7	30.4	50.8	35.4
47.2	-4.2	24.6	60.8	27.6
61.4	11.0	35.6	81.0	41.5

TABLE I-H.-Yearly per cent change in estimates of resident population by age, sex and race (including military forces stationed in the United States but excluding those stationed outside the United States) as of July 1, 1946-1960, inclusive<sup>a</sup>

Year	Race	Total	Male				Total
			Under 20	20-34	35-64	65 & over	
1946	White	0.0	0.0	0.0	0.0	0.0	0.0
	Non-wh	0.0	0.0	0.0	0.0	0.0	0.0
1947	White	2.5	4.9	2.5	1.5	3.0	2.9
	Non-wh	2.0	2.9	0.7	1.5	3.2	1.9
1948	White	1.9	3.0	0.7	1.4	2.8	1.9
	Non-wh	1.8	2.4	0.4	1.4	2.1	1.6
1949	White	1.8	2.4	0.4	1.6	2.9	1.7
	Non-wh	1.7	2.4	-0.6	1.6	1.8	1.5
1950	White	1.4	2.1	0.6	1.1	1.9	1.4
	Non-wh	1.3	2.0	-0.3	1.1	1.7	1.1
1951	White	1.7	3.0	-2.4	1.6	3.2	1.3
	Non-wh	2.5	4.7	-1.5	1.3	3.2	2.2
1952	White	1.5	3.0	-0.9	1.1	2.5	1.2
	Non-wh	2.2	3.9	-0.3	1.0	2.9	2.0
1953	White	1.6	3.2	-0.7	0.9	2.2	1.5
	Non-wh	2.2	4.1	-0.4	0.8	1.8	2.0
1954	White	1.7	3.2	-0.3	1.3	2.3	1.7
	Non-wh	2.6	4.5	1.2	1.1	2.7	2.6
1955	White	1.8	3.0	1.1	1.2	2.2	1.9
	Non-wh	2.7	4.0	2.8	1.4	2.2	2.9
1956	White	1.7	3.0	-0.2	1.3	1.9	1.7
	Non-wh	2.7	4.4	1.1	1.4	1.7	2.7
1957	White	1.7	3.2	-0.6	1.2	1.7	1.7
	Non-wh	2.7	4.5	0.4	1.6	2.1	2.7
1958	White	1.6	3.0	-0.3	1.2	1.3	1.6
	Non-wh	2.6	4.2	1.4	1.5	1.0	2.7
1959	White	1.7	2.9	0.1	1.2	1.6	1.7
	Non-wh	2.8	4.2	1.3	1.7	1.9	2.8
1960	White	1.8	1.9	-0.5	1.3	7.2	1.7
	Non-wh	4.3	2.6	-0.4	6.5	20.8	4.0

<sup>a</sup>Calculated from: U. S. Department of Commerce, Bureau of the Census, Current Population Reports, Population Estimates (Washington: U. S. Government Printing Office), Series P-25, Nos. 73, 93, 98, 101, 121, 146, 170, 193, 212, 246.



TABLE I-H.-Continued

Female				
Under 20	20-34	35-64	65 & over	Total
0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0
3.0	0.7	1.7	3.6	2.0
2.1	1.1	2.3	4.1	2.0
2.3	0.7	1.7	3.6	1.8
2.0	1.2	2.3	2.9	1.9
2.3	0.5	1.8	3.7	1.8
2.3	1.1	2.3	3.0	2.0
1.9	0.3	1.2	2.7	1.3
1.9	0.8	1.5	1.7	1.5
3.1	-0.2	2.3	4.1	2.1
4.5	0.3	2.6	4.6	2.9
2.9	-0.4	1.7	3.0	1.7
3.6	0.6	1.9	3.2	2.3
3.0	-0.7	1.6	2.9	1.7
3.9	0.4	1.7	3.4	2.4
3.2	-0.8	1.6	3.1	1.7
4.1	0.3	1.9	3.5	2.5
3.1	-0.7	1.6	3.1	1.7
4.0	0.3	2.0	3.4	2.5
3.0	-0.8	1.7	2.8	1.7
4.4	0.1	2.1	3.2	2.7
3.1	-0.9	1.7	2.9	1.8
4.3	0.2	2.1	2.9	2.7
2.9	-0.8	1.5	2.6	1.6
4.0	0.2	2.0	2.7	2.5
2.3	-0.6	1.5	2.7	1.7
4.2	0.5	2.2	3.2	2.8
2.6	-0.5	0.6	7.6	1.8
3.5	3.1	4.0	20.0	4.5

TABLE I-I.-Estimates of the population 14 years old and older by marital status and sex (in thousands), 1947-1960, inclusive<sup>a</sup>

Year	Total	Male				
		Total	Single	Married	Widowed	Divorced
Number of people						
1947	107,156	52,350	14,760	34,638	2,134	818
1948	108,591	53,227	14,734	35,411	2,055	1,027
1949	109,449	53,448	13,952	36,474	2,181	842
1950	111,732	54,762	14,322	37,227	2,296	917
1951	110,774	53,420	12,984	37,354	2,216	866
1952	111,598	53,564	12,868	37,830	2,102	764
1953	113,724	54,784	13,000	38,612	2,228	944
1954	114,839	55,297	13,004	39,042	2,171	1,080
1955	116,244	55,994	13,522	39,125	2,357	990
1956	117,719	56,744	13,516	39,967	2,335	926
1957	119,333	57,470	13,754	40,490	2,186	1,040
1958	121,246	58,462	14,331	40,831	2,272	1,028
1959	122,819	59,258	14,768	41,236	2,161	1,093
1960	124,880	60,273	15,274	41,781	2,112	1,106
Per cent of population						
1947		48.9	27.2	66.9	4.3	1.6
1948		49.0	27.7	66.5	3.8	1.9
1949		48.8	26.1	68.2	4.1	1.2
1950		49.0	26.2	68.0	4.2	1.7
1951		48.2	24.3	69.9	4.1	1.6
1952		48.0	24.0	70.6	3.9	1.4
1953		48.2	23.7	70.5	4.2	1.7
1954		48.2	23.5	70.6	4.1	2.0
1955		48.2	24.1	69.9	3.9	1.8
1956		48.2	23.8	70.4	4.1	1.6
1957		48.2	23.9	70.5	3.8	1.8
1958		48.2	24.5	69.8	3.9	1.8
1959		48.2	24.9	69.6	3.6	1.8
1960		48.3	25.3	69.3	3.5	1.8

TABLE I-I.-Continued

Total	Single	Female		
		Married	Widowed	Divorced
		Number of people		
54,806	12,078	35,212	6,376	1,140
55,364	11,623	35,783	6,725	1,233
56,001	11,174	37,012	6,582	1,233
56,970	11,139	37,633	6,967	1,231
57,354	10,946	38,124	7,084	1,200
58,034	11,068	38,670	6,972	1,324
58,940	10,774	39,426	7,404	1,336
59,542	11,043	39,869	7,256	1,374
60,250	10,962	40,327	7,595	1,366
60,975	11,126	40,650	7,707	1,492
61,863	11,487	41,204	7,778	1,394
62,784	11,822	41,457	8,047	1,458
63,561	11,884	42,127	8,002	1,548
64,607	12,252	42,583	8,064	1,708
Per cent of population				
51.1	22.0	64.2	11.6	2.1
51.0	20.9	64.6	12.1	2.2
51.2	20.0	66.1	11.8	2.2
51.0	19.6	66.1	12.2	2.2
51.8	19.1	66.5	12.4	2.1
52.0	19.1	66.6	12.0	2.3
51.8	18.3	66.9	12.6	2.3
51.8	18.5	67.0	12.2	2.3
51.8	18.2	66.9	12.6	2.3
51.8	18.2	66.7	12.6	2.4
51.8	18.6	66.6	12.6	2.3
51.8	18.8	66.0	12.8	2.3
51.8	18.7	66.3	12.6	2.4
51.7	19.0	65.9	12.5	2.6



TABLE I-I.-Continued

Year	Total	Male				
		Total	Single	Married	Widowed	Divorced
Per cent change from 1947						
1947	0.0	0.0	0.0	0.0	0.0	0.0
1948	1.3	1.7	-0.2	2.2	-3.7	25.6
1949	2.1	2.1	-5.5	5.3	2.2	2.9
1950	4.3	4.6	-3.0	7.5	7.6	12.1
1951	3.4	2.0	-12.0	7.8	3.8	5.9
1952	4.1	2.3	-12.8	9.2	-1.5	-6.6
1953	6.1	4.6	-11.9	11.5	4.4	15.4
1954	7.2	5.6	-11.9	12.7	1.7	32.0
1955	8.5	7.0	-8.4	13.0	10.4	21.0
1956	9.9	8.4	-8.4	15.4	9.4	13.2
1957	11.4	9.8	-6.8	16.9	2.4	27.1
1958	13.1	11.7	-2.9	17.9	6.5	25.7
1959	14.6	13.2	0.1	19.0	1.3	33.6
1960	16.5	15.1	3.5	20.6	-1.0	35.2
Annual per cent change						
1947		0.0	0.0	0.0	0.0	0.0
1948		1.7	-0.2	2.2	-3.7	25.6
1949		0.4	-5.3	3.0	6.1	-18.0
1950		2.5	2.7	2.1	5.3	8.9
1951		-2.5	-9.3	0.3	-3.5	5.6
1952		0.3	-0.9	1.3	-5.1	-11.8
1953		2.3	1.0	2.1	6.0	23.6
1954		0.9	0.0	1.1	-2.5	14.4
1955		1.3	4.0	0.2	8.6	-8.3
1956		1.3	0.0	2.2	-0.9	-6.5
1957		1.3	1.8	1.3	-6.4	12.3
1958		1.7	4.2	0.8	3.9	-1.2
1959		1.4	3.0	1.0	-4.9	6.3
1960		1.7	3.4	1.3	-2.3	1.2

<sup>a</sup>Calculated from: U. S. Department of Commerce, Bureau of the Census, Current Population Reports, Population Estimates (Washington: U. S. Government Printing Office ), Series P-25, Nos. 73, 93, 98, 101, 121, 146, 170, 193, 212, 246.

TABLE I-I.-Continued

Total	Female			
	Single	Married	Widowed	Divorced
Per cent change from 1947				
0.0	0.0	0.0	0.0	0.0
1.0	-3.7	1.6	5.5	8.2
2.2	-7.5	5.1	3.2	8.2
3.9	-7.8	6.9	9.3	8.0
4.6	-9.4	8.3	11.1	5.3
5.9	-8.4	9.8	9.3	16.1
7.5	-10.8	12.0	16.1	17.2
8.6	-8.6	13.2	13.8	20.5
9.9	-9.2	14.5	19.1	19.8
11.3	-7.9	15.4	20.9	30.9
12.9	-4.9	17.0	22.0	22.3
14.6	-2.1	17.7	26.2	27.9
16.0	-1.6	19.6	25.5	35.8
17.9	1.4	20.9	26.5	49.8
Annual per cent change				
0.0	0.0	0.0	0.0	0.0
1.0	-3.7	1.6	5.5	8.2
1.2	-3.9	3.4	-2.1	0.0
1.7	-0.3	1.7	5.8	-0.2
0.7	-1.7	1.3	1.7	-2.5
1.2	1.1	1.4	-1.6	10.3
1.6	-2.7	2.0	6.2	0.9
1.0	2.5	1.1	-2.0	2.8
1.2	-0.7	1.1	4.7	-0.6
1.2	1.5	0.8	1.5	9.2
1.5	3.2	1.4	0.9	-6.6
1.5	2.9	0.6	3.5	4.6
1.2	0.5	1.6	-0.6	6.2
1.6	3.1	1.1	0.8	10.3

TABLE I-J.-Estimates of the population 14 years old and older by marital status (in thousands), 1947-1960, inclusive<sup>a</sup>

Year	Total	Single	Married	Widowed	Divorced
Number of people					
1947	107,156	26,838	69,850	8,510	1,958
1948	108,591	26,357	71,194	8,780	2,260
1949	109,449	25,126	73,486	8,763	2,075
1950	111,732	25,461	74,860	9,300	2,148
1951	110,774	23,930	75,478	9,074	2,066
1952	111,598	23,936	76,500	9,632	2,088
1953	113,724	23,774	78,038	9,427	2,280
1954	114,839	24,047	78,911	9,952	2,454
1955	116,244	24,484	79,452	10,042	2,356
1956	117,719	24,642	80,617	9,964	2,418
1957	119,333	25,241	81,694	10,319	2,434
1958	121,246	26,153	82,288	10,163	2,486
1959	122,819	26,652	83,363	10,176	2,641
1960	124,880	27,526	84,364	10,273	2,814
Per cent of population					
1947		25.0	65.2	7.9	1.8
1948		24.3	65.6	8.1	2.1
1949		23.0	67.1	8.0	1.9
1950		22.8	67.0	8.3	1.9
1951		21.6	68.1	8.4	1.9
1952		21.4	68.5	8.1	1.9
1953		20.9	68.6	8.5	2.0
1954		20.9	68.7	8.2	2.1
1955		21.1	68.3	8.6	2.0
1956		20.9	68.5	8.5	2.1
1957		21.2	68.5	8.3	2.0
1958		21.6	67.9	8.5	2.1
1959		21.7	67.9	8.3	2.2
1960		22.0	67.6	8.1	2.3



TABLE I-J.-Continued

Year	Total	Single	Married	Widowed	Divorced
Per cent change from 1947					
1947	0.0	0.0	0.0	0.0	0.0
1948	1.3	-1.8	1.9	3.2	15.4
1949	2.1	-6.4	5.2	3.0	6.0
1950	4.3	-5.1	7.2	8.8	9.7
1951	3.4	-10.8	8.1	9.3	5.5
1952	4.1	-10.8	9.5	6.6	6.6
1953	6.1	-11.4	11.7	13.2	16.4
1954	7.2	-10.4	13.0	10.8	25.3
1955	8.5	-8.8	13.7	16.9	20.3
1956	9.9	-8.2	15.4	18.0	23.5
1957	11.4	-6.0	17.0	17.1	24.3
1958	13.1	-2.6	17.8	21.3	27.0
1959	14.6	-0.7	19.3	19.4	34.9
1960	16.5	2.6	20.8	19.6	43.7
Per cent change from year to year					
1947		0.0	0.0	0.0	0.0
1948		-1.8	1.9	3.2	15.4
1949		-4.7	3.2	-0.2	-8.2
1950		1.3	1.9	5.7	3.5
1951		-6.0	0.8	0.4	-3.8
1952		0.0	1.4	-2.4	1.1
1953		-0.7	2.0	6.1	9.2
1954		1.1	1.1	-2.1	7.6
1955		1.8	0.7	5.6	-4.0
1956		0.6	1.5	0.9	2.6
1957		2.4	1.3	-0.8	0.7
1958		3.6	0.7	3.6	2.1
1959		1.9	1.3	-1.5	6.2
1960		3.3	1.2	0.1	6.6

<sup>a</sup>Calculated from: U. S. Department of Commerce, Bureau of the Census, Current Population Reports, Population Estimates (Washington: U. S. Government Printing Office ), Series P-25, Nos. 73, 93, 98, 101, 121, 146, 170, 193, 212, 246.

TABLE I-K.-Estimates of the number of physicians gainfully employed,  
1946-1960<sup>a</sup>

Year	Physicians	Physicians/100,000 population
1946	na	na
1947	na	na
1948	na	na
1949	201,277	135
1950	203,400	134
1951	205,500	133
1952	207,900	132
1953	210,900	132
1954	214,200	132
1955	218,061	132
1956	na	na
1957	226,625	132
1958	na	na
1959	236,818	133
1960	na	na

<sup>a</sup>Source: U. S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1957 (Washington: 1960), p. 34; and, U. S. Bureau of the Census, Statistical Abstract of the United States: 1961. (82nd ed.; Washington: 1961), p. 69.

naNot available.

## APPENDIX II



TABLE II-A.-Employment status of the non-institutional population (in thousands of persons 14 years old and older), by sex, 1950-1960, with per cent distribution and per cent change from 1950<sup>a</sup>

Year	Total non-instit. pop.	Civilian labor force				
		Total	Employed			Unemployed
			Total	Ag.	Non-ag.	
Number of males						
1950	54,526	44,442	42,162	6,271	35,891	2,280
1951	54,996	43,612	42,362	5,791	36,571	1,250
1952	55,503	43,454	42,237	5,623	36,614	1,217
1953	56,534	44,194	42,966	5,496	37,470	1,228
1954	57,016	44,537	42,165	5,429	36,736	2,372
1955	57,484	45,041	43,152	5,479	37,673	1,889
1956	58,044	45,756	43,999	5,268	38,731	1,757
1957	58,813	45,882	43,990	5,037	38,952	1,893
1958	59,478	46,197	43,042	4,802	38,240	3,155
1959	60,100	46,562	44,089	4,749	39,340	2,473
1960	61,000	47,025	44,465	4,678	39,807	2,541
Per cent distribution of males						
1950	b	81.5 <sup>d</sup>	94.9 <sup>e</sup>	14.9 <sup>f</sup>	85.1 <sup>f</sup>	5.1 <sup>e</sup>
1951		79.3	97.1	13.7	86.3	2.9
1952		78.3	97.2	13.3	86.7	2.8
1953		78.2	97.2	12.8	87.2	2.8
1954		78.1	94.7	12.9	87.1	5.3
1955		78.4	95.8	12.7	87.3	4.2
1956		78.8	96.2	12.0	88.0	3.8
1957		78.0	95.9	11.5	88.5	4.1
1958		77.7	93.2	11.2	88.8	6.8
1959		77.5	94.7	10.8	89.2	5.3
1960		77.1	94.6	10.5	89.5	5.4
Per cent change from 1946 in male labor force						
1950	0.0	0.0	0.0	0.0	0.0	0.0
1951	0.9	-0.9	0.5	-7.7	1.9	-45.2
1952	1.8	-2.2	0.2	-10.3	2.0	-46.6
1953	3.7	-0.6	1.9	-12.4	4.4	-46.1
1954	4.6	0.2	0.0	-13.4	2.4	4.0
1955	-0.1	1.3	2.3	-12.6	5.0	-17.1
1956	6.5	3.0	4.4	-16.0	7.9	-22.9
1957	7.9	3.2	4.3	-19.7	8.5	-17.0
1958	9.1	3.9	2.1	-23.4	6.5	38.4
1959	10.2	4.8	4.6	-24.3	9.6	8.5
1960	11.9	5.8	5.5	-25.4	10.9	11.4

TABLE II-A.-Continued

Not in labor force				Military
Total	Keeping house	In school	Other	
Number of males				
8,457	81	3,244	5,132	1,627
8,322	98	2,940	5,284	3,062
8,502	69	3,002	5,431	3,547
8,840	85	2,987	5,768	3,500
9,169	111	3,152	5,906	3,310
9,430	76	3,313	6,042	3,013
9,465	93	3,289	6,083	2,823
10,164	94	3,546	6,524	2,767
10,677	102	3,800	6,774	2,604
11,019	83	3,871	7,065	2,519
11,493	87	4,097	7,310	2,482
Per cent distribution of males				
15.5 <sup>d</sup>	c	c	c	3.0 <sup>d</sup>
15.1				5.6
15.3				6.4
15.6				6.2
16.1				5.8
16.4				5.2
16.3				4.9
17.3				4.7
18.0				4.3
18.3				4.2
18.8				4.1
Per cent change from 1946 among males not in labor force				
0.0	0.0	0.0	0.0	
-1.6	21.0	-9.4	3.0	
0.5	-14.8	-7.5	5.8	
4.5	4.9	-7.9	12.4	
8.4	37.0	-2.8	15.1	
11.5	-6.2	2.1	17.1	
11.9	14.8	1.4	18.5	
20.2	16.0	9.3	27.1	
26.3	25.9	17.1	32.0	
30.3	2.5	19.3	37.7	
35.9	7.4	26.3	42.4	



TABLE II-A.-Continued

Year	Total non-instit. pop.	Civilian labor force				
		Total	Employed			Unemployed
			Total	Ag.	Non-ag.	
Number of females						
1950	56,404	18,657	17,584	1,226	16,358	1,073
1951	57,078	19,272	18,421	1,257	17,164	851
1952	57,776	19,513	18,798	1,170	17,628	715
1953	58,561	19,621	18,979	1,061	17,918	642
1954	59,203	19,931	18,724	1,067	17,657	1,207
1955	59,904	20,806	19,790	1,239	18,551	1,016
1956	60,690	21,774	20,707	1,306	19,401	1,067
1957	61,632	22,064	21,021	1,184	19,837	1,043
1958	62,472	22,451	20,924	1,042	19,882	1,526
1959	63,265	22,832	21,492	1,087	20,405	1,340
1960	64,368	23,587	22,196	1,045	21,151	1,390
Per cent distribution of females						
1950	b	33.1	94.2 <sup>e</sup>	7.0 <sup>f</sup>	93.0 <sup>f</sup>	5.8 <sup>e</sup>
1951		33.8	95.6	6.8	93.2	4.4
1952		33.8	96.3	6.2	93.8	3.7
1953		33.5	96.7	5.6	94.4	3.3
1954		33.7	93.9	5.7	94.3	6.1
1955		34.7	95.1	6.3	93.7	4.9
1956		35.9	95.1	6.3	93.7	4.9
1957		35.8	95.3	5.6	94.4	4.7
1958		35.9	93.2	5.0	95.0	6.8
1959		36.1	94.1	5.1	94.9	5.9
1960		36.6	94.1	4.7	95.3	5.9
Per cent change from 1946 in female labor force						
1950	0.0	0.0	0.0	0.0	0.0	0.0
1951	1.2	3.3	4.8	2.5	4.9	-20.7
1952	2.4	4.6	6.9	-4.6	7.8	-33.3
1953	3.8	5.2	7.9	-13.5	9.5	-40.2
1954	5.0	6.8	6.5	-13.0	7.9	12.5
1955	6.2	11.5	12.5	1.1	13.4	-5.3
1956	7.6	16.7	17.8	6.5	18.6	-0.6
1957	9.3	18.3	19.5	-3.4	21.3	-2.8
1958	10.8	20.3	19.0	-15.0	21.5	42.2
1959	12.2	22.4	22.2	-11.3	24.7	24.9
1960	14.1	26.4	26.2	-14.8	29.3	29.5

<sup>a</sup>Taken and calculated from: U. S. Bureau of the Census, Statistical Abstract of the United States: 1962 (83rd ed.; Washington: 1962), p. 215.

<sup>b</sup>This column represents 100 per cent for all years.



TABLE II-A.-Continued

Not in labor force				Military
Total	Keeping house	In school	Other	
Number of females				
37,724	32,977	2,954	1,794	23
37,770	33,007	2,888	1,875	36
38,208	33,266	3,038	1,904	45
38,893	33,940	3,047	1,907	47
39,232	33,782	3,158	2,292	40
39,062	33,646	3,256	2,160	36
38,883	33,306	3,304	2,272	33
39,535	33,798	3,501	2,235	33
39,990	34,131	3,724	2,135	31
40,401	34,404	3,890	2,107	32
40,749	34,456	4,065	2,228	32
Per cent distribution of females				
66.9 <sup>d</sup>	c	c	c	0.0 <sup>d</sup>
66.2				0.0
66.1				0.1
66.4				0.1
66.3				0.0
65.2				0.1
64.1				0.0
64.1				0.1
64.0				0.1
63.9				0.0
63.3				0.1
Per cent change from 1946 among females not in labor force				
0.0	0.0	0.0	0.0	0.0
-20.7	0.1	0.1	-2.2	4.5
-33.3	1.3	0.9	2.8	6.1
-40.2	3.1	2.9	3.1	6.3
12.5	4.0	2.4	6.9	27.8
-5.3	3.5	2.0	10.2	20.4
-0.6	3.1	1.0	11.8	26.6
-2.8	4.8	2.5	18.5	24.6
42.2	6.0	3.5	26.1	19.0
24.9	7.1	4.3	31.7	17.4
29.5	8.0	4.5	37.6	24.2

<sup>c</sup>The percentages for these columns were not computed since they are not particularly pertinent to this study.

<sup>d</sup>The figures are percentages of total non-institutional population shown in column 2.

<sup>e</sup>These columns show percentages of total civilian work force, column 3.

<sup>f</sup>Percentages of column 4, total employed, are shown here.

TABLE II-B.-Per cent distribution of total non-institutional population and total civilian labor force, 14 years old and older, 1950-1960, inclusive<sup>a</sup>

Year	Male		Female	
	Total non-instit. pop.	Total civ. labor force	Total non-instit. pop.	Total civ. labor force
1950	49.2	70.4	50.8	29.6
1951	49.1	69.4	50.9	30.6
1952	49.0	69.0	51.0	31.0
1953	49.1	69.3	50.9	30.7
1954	49.1	69.1	50.9	30.9
1955	49.0	68.4	53.6	31.6
1956	48.9	67.8	51.1	32.2
1957	48.8	67.5	51.2	32.6
1958	48.8	67.3	51.2	32.7
1959	48.7	67.1	51.3	32.9
1960	48.7	66.6	51.3	33.4

<sup>a</sup>Calculated from: U. S. Bureau of the Census, Statistical Abstract of the United States: 1962 (83rd ed.; Washington: 1962), p. 215.

TABLE II-C.-Personal income (in billions) in constant dollars (1947-49=100), 1946-1960, inclusive, with per cent change from 1946<sup>a</sup>

Year	Personal income	Per cent change	Personal inc. excl. wages & sal.	Per cent change
1946	215.0	0.0	90.3	0.0
1947	200.6	-6.7	70.0	-22.5
1948	204.7	-4.8	71.4	-20.1
1949	204.6	-4.8	70.4	-22.0
1950	222.3	3.4	77.2	-14.5
1951	231.3	7.6	76.7	-15.1
1952	240.6	11.9	78.0	-13.6
1953	252.0	17.2	78.4	-13.1
1954	252.4	17.4	80.2	-11.2
1955	270.9	26.0	83.9	-7.1
1956	287.3	33.6	86.9	-3.8
1957	292.3	36.0	87.8	-2.8
1958	291.7	35.7	91.4	1.2
1959	307.6	43.1	92.0	1.9
1960	317.9 <sup>b</sup>	47.9	93.6	3.7

<sup>a</sup>Calculated from: U. S. Bureau of the Census, Statistical Abstract of the United States: 1962 (83rd ed.; Washington: 1962), p. 318.; and, U. S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1957 (Washington: 1960), p. 139.

<sup>b</sup>Includes Alaska and Hawaii.

### APPENDIX III



TABLE III-A.-Number of short-term general and other special hospitals in the United States, 1958-1960, by service, with per cent distribution<sup>a</sup>

Year	U. S. Total	Short-term total	Fed. total	Non-fed. total	Psy.	Gen.	Mat.	EENT	Child- ren's	Ortho.	All other
Hospitals											
1958		5,641	278	5,363	73	5,095	49	41	40	19	46
1959		5,707	288	5,419	55	5,152	51	41	55	7	58
1960		5,826	361	5,465	58	5,217	47	40	57	6	40
Per cent distribution											
1958		4.9	95.1	1.3	90.3	0.9	0.7	0.7	0.3	0.8	
1959		5.0	95.0	1.0	90.3	0.9	0.7	1.0	0.1	1.0	
1960		6.2	93.8	1.0	89.5	0.8	0.7	1.0	0.1	0.7	

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1959-1961).

TABLE III-B.-Number of beds in short-term general and other special hospitals in the United States, 1946-1960, by service, with per cent distribution, and per cent change from 1957<sup>a</sup>

Year	U. S.		Short-term		Fed.		Non-fed.		Psy.		Gen.		Mat.		EENT		Child-		Ortho		All	
	total		total		total		total		total		total		total		total		ren's		other		other	
Beds																						
1957	1,558,691	649,899	0	0	0	0	0	0	3,003	632,231	2,291	2,087	5,264	1,296	3,199							
1958	1,572,036	665,930	51,534	614,396	4,664	594,518	2,177	1,938	5,277	1,564	4,258											
1959	1,612,822	691,444	58,323	633,121	13,244	604,036	2,520	1,933	6,231	658	4,499											
1960	1,657,970	738,627	96,394	642,233	3,176	624,045	2,264	2,068	6,796	572	3,312											
Per cent distribution																						
1957	41.7	0.0	0.0	0.0	0.5	97.3	0.4	0.3	0.8	0.2	0.5											
1958	42.4	7.7	92.3	0.7	89.3	0.3	0.3	0.8	0.2	0.6												
1959	42.9	8.4	91.6	1.9	87.4	0.4	0.3	0.9	0.1	0.7												
1960	44.6	13.1	86.9	0.4	84.5	0.3	0.3	0.9	0.1	0.4												
Per cent change from 1957																						
1957	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0											
1958	9.5	2.5	0.0	0.0	55.3	-6.0	-5.0	-07.1	0.2	20.7	33.1											
1959	12.3	6.4	0.0	0.0	341.0	-4.5	10.0	-7.4	18.4	-49.2	40.6											
1960	15.5	13.7	0.0	0.0	5.8	-1.3	-1.2	-0.9	29.1	-55.9	3.5											

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

TABLE III-C.-Number of admissions (in thousands) to short-term general and other special hospitals in the United States, 1957-1960, by service, with per cent distribution, and per cent change from 1957<sup>a</sup>

Year	U. S. total	Short-term total	Fed. total	Non-fed. total	Psy.	Gen.	Mat.	EENT	Child- ren's	Ortho.	All other
Admissions											
1957	22,993	22,009	na	21,574	41	21,463	98	113	204	25	58
1958	23,697	22,726	986	21,740	56	21,168	94	108	214	29	71
1959	23,605	22,682	1,037	21,645	40	21,084	100	104	232	10	75
1960	25,027	24,368	1,354	23,015	44	22,446	96	106	251	10	61
Per cent distribution											
1958		2.0		98.0	0.2	97.5	0.4	0.5	0.9	0.1	0.3
1959		4.3		95.7	0.2	93.1	0.4	0.5	0.9	0.1	0.3
1960		4.6		95.4	0.2	93.0	0.4	0.5	1.0	0.0	0.3
Per cent change from 1958											
1959	-0.4	-0.2									
1959	-0.4	-0.2	5.2	-0.4	-28.3	-0.4	6.3	-3.6	8.4	-65.8	6.6
1960	5.6	7.2	37.3	5.9	-21.1	6.0	2.3	-1.6	17.3	-65.3	-13.8

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

na Not available.



TABLE III-D.-Average daily census (in thousands) in short-term general and other special hospitals in the United States, 1957-1960, by service, with per cent distribution<sup>a</sup>

Year	U. S. total	Short-term total	Fed. total	Non-fed. total	Psy.	Gen.	Mat.	EENT	Child- ren's	Ortho.	All other
Average daily census											
1957	1,320	477	na	na	2	466	1	1	4	1	2
1958	1,232	493	38	454	3	441	1	1	4	1	3
1959	1,363	519	45	474	12	451	2	1	4	b	3
1960	1,402	559	80	480	2	467	1	1	5	b	2
Per cent distribution											
1957	36.1	na	na	na	0.4	97.6	0.3	0.3	0.8	0.2	0.4
1958	37.3	7.8	92.2	0.7	89.5	0.3	0.2	0.8	0.2	0.2	0.5
1959	38.1	8.7	91.3	2.3	86.9	0.3	0.2	0.9	0.1	0.4	0.4
1960	39.9	14.2	85.8	0.4	83.5	0.3	0.2	0.9	0.1	0.4	0.4

<sup>a</sup>Taken from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

<sup>b</sup>Less than one.

na Not available.

TABLE III-E.-Occupancy percentage of average daily census in short-term general and other special hospitals in the United States, 1957-1960, by service<sup>a</sup>

Year	U. S. total	Short-term total	Fed. total	Non-fed. total	Psy.	Gen.	Mat.	EENT	Child- ren's	Ortho.	All other
1957	84.7	73.4	na	na	65.1	73.7	65.0	58.1	71.7	68.2	62.5
1958	84.2	74.0	74.6	74.0	70.2	74.2	63.2	60.3	72.7	68.4	63.3
1959	84.5	75.0	77.5	74.8	88.4	74.7	66.1	60.2	71.5	71.7	69.9
1960	84.6	75.7	82.5	74.7	69.9	74.9	62.5	63.3	71.5	73.3	70.1

<sup>a</sup>Taken from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.

TABLE III-F.-Average length of stay in short-term general and other special hospitals in the United States, 1957-1960, by service, with per cent change from 1957<sup>a</sup>

Year	U. S. total	Short-term total	Fed. total	Non-fed. total	Psy. total	Gen.	Mat.	EENT	Child- ren's	Ortho.	All other
Average length of stay											
1957	na	7.9	na	na	17.2	7.9	5.6	3.9	6.8	12.7	12.6
1958	na	7.9	14.2	7.6	21.2	7.6	5.4	4.0	6.5	13.3	13.9
1959	na	8.4	15.9	8.0	5.7	7.8	6.1	4.1	7.0	17.1	15.3
1960	na	8.4	21.4	7.6	8.2	7.6	5.4	4.5	7.1	15.0	13.9
Per cent change from 1957											
1958	na	0.0	na	na	23.3	-3.8	-3.6	2.3	-4.4	4.7	10.3
1959	na	6.3	12.0	5.3	-66.9	-1.3	13.0	5.1	2.9	34.6	21.4
1960	na	6.3	50.7	0.0	-51.3	-3.8	-3.6	15.4	4.4	18.1	10.3

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

na Not available.

#### APPENDIX IV



TABLE IV-A.-Average daily census (in thousands) of short-term general and other special hospitals in the United States reporting personnel, 1957-1960, by size, with per cent distribution and per cent change from 1957<sup>a</sup>

Year	Total	Under 25 bds	25-49	50- 99	100- 199	200- 299	300- 499	500 & over
Average daily census								
1957	429	7	27	55	97	83	84	76
1958	438	6	27	56	98	85	86	80
1959	441	6	27	55	100	85	92	76
1960	462	6	28	60	102	91	100	76
Per cent distribution								
1957		1.6	6.4	12.9	22.6	19.3	19.6	17.6
1958		1.4	6.1	12.7	22.5	19.4	19.7	18.2
1959		1.3	6.0	12.5	22.7	19.3	20.9	17.2
1960		1.3	6.1	12.9	22.1	19.7	21.5	16.3
Per cent change from 1957								
1958	2.1	-11.7	-1.7	0.5	1.3	2.7	2.6	5.6
1959	2.7	-18.0	-2.7	-0.3	3.3	2.7	9.8	0.3
1960	7.7	-13.6	4.0	8.0	5.0	10.1	18.2	-0.3

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

TABLE IV-B.-Average daily census (in thousands) of voluntary short-term general and other special hospitals in the United States reporting personnel, 1957-1960, by size, with per cent distribution and per cent change from 1957<sup>a</sup>

Year	Total	Under 25 bds	25-49	50- 99	100- 199	200- 299	300- 499	500 & over
Average daily census								
1957	305	3	14	38	77	70	72	32
1958	314	2	13	38	78	73	75	35
1959	319	2	13	37	80	73	80	34
1960	340	2	14	39	79	78	87	40
Per cent distribution								
1957		0.9	4.4	12.4	25.4	23.0	23.6	10.4
1958		0.8	4.3	11.9	24.8	23.3	23.8	11.1
1959		0.7	4.2	11.6	25.0	22.8	24.9	10.8
1960		0.7	4.1	11.6	23.3	23.0	25.6	11.7
Per cent change from 1957								
1958	2.8	-10.2	-18.6	-0.5	0.4	4.4	3.8	9.7
1959	4.6	-15.9	-0.5	-2.0	2.9	4.1	10.5	8.2
1960	11.2	-9.6	1.6	4.4	2.3	11.3	20.7	25.0

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

TABLE IV-C.-Average daily census (in thousands) of proprietary short-term general and other special hospitals in the United States, reporting personnel, 1957-1960, by size, with per cent distribution and per cent change from 1957<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over
Average daily census								
1957	22	3	7	6	5	1	0	b
1958	22	3	6	6	5	1	0	b
1959	21	2	6	6	5	1	b	b
1960	23	2	6	7	6	1	b	b
Per cent distribution								
1957		13.2	29.6	26.4	23.1	5.9	0.0	1.8
1958		11.9	28.9	27.9	23.4	6.1	0.0	1.8
1959		10.8	28.9	28.0	24.3	5.3	1.2	1.4
1960		10.3	27.6	29.3	24.5	5.8	1.1	1.3
Per cent change from 1957								
1958	-2.9	-12.5	-5.2	2.6	-1.8	-0.5	0.0	1.0
1959	-6.5	-23.2	-8.8	-0.9	-1.7	-15.8	0.0	-26.3
1960	3.3	-19.3	-3.6	14.9	9.6	0.6	0.0	-23.0

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

<sup>b</sup>Less than one.

TABLE IV-D.-Average daily census (in thousands) of state and local governmental short-term general and other special hospitals in the United States, reporting personnel, 1957-1960, by size, with per cent distribution and per cent change from 1957<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over
Average daily census								
1957	102	1	7	12	15	11	12	44
1958	103	1	7	12	16	11	12	45
1959	101	1	7	12	16	11	12	41
1960	100	1	8	14	17	12	12	35
Per cent distribution								
1957		1.4	7.0	11.5	14.3	11.2	11.9	42.8
1958		1.2	6.9	11.7	15.3	10.2	11.2	43.5
1959		1.3	7.0	12.2	15.4	10.9	12.4	40.9
1960		1.3	8.3	13.6	17.2	11.8	12.3	35.6
Per cent change from 1957								
1958	0.9	-12.7	-0.6	2.6	7.6	-7.6	-4.7	2.6
1959	-1.0	-11.0	-1.4	5.4	6.8	-3.8	3.2	-5.3
1960	-2.1	-9.4	15.5	16.1	17.5	3.6	1.4	-18.6

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).



TABLE IV-E.-Full-time personnel (in thousands) in short-term general and other special hospitals in the United States, 1957-1960, by service, with per cent distribution and per cent change from 1958<sup>a</sup>

Year	U.S. total	Short-term total	Fed. total	Non-fed total	Psy.	Gen.	Mat.	EENT	Child- ren's	Ortho.	All other
Full-time personnel											
1957	1,401	995	na	na	2	965	5	3	11	2	6
1958	1,465	1,051	64	987	3	955	4	3	11	3	8
1959	1,520	1,110	74	1,037	5	1,000	5	3	13	1	9
1960	1,598	1,210	126	1,083	3	1,048	5	3	14	1	8
Per cent distribution											
1957		71.0	na	na	0.2	97.0	0.5	0.3	1.1	0.2	0.6
1958		71.7	6.1	93.9	0.3	90.9	0.4	0.3	1.0	0.3	0.7
1959		73.0	6.7	93.3	0.5	90.0	0.4	0.3	1.2	0.1	0.8
1960		75.7	10.4	89.6	0.2	86.7	0.4	0.3	1.2	0.1	0.7
Per cent change from 1958											
1959	3.8	5.7	16.0	5.1	57.2	4.7	11.3	4.4	17.1	-56.4	18.2
1960	9.1	15.1	98.2	9.7	-12.8	9.8	1.9	13.3	31.0	-52.1	5.6

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

na Not available.



TABLE IV-F.-Full-time personnel per 100 patients in short-term general and other special hospitals in the United States, 1957-1960, by service, with per cent change from 1958<sup>a</sup>

Year	U. S. Short-term		Fed.		Non-fed.		Psy.		Gen.		Mat.		EENT		Child-		Ortho.		All other	
	total	total	total	total	total	total	total	total	total	total	total	total	total	total	total	total	total	total	total	total
Full-time personnel																				
1957	107	209	na	na	na	125	207	311	268	286	268	286	268	286	268	286	268	286	321	321
1958	111	213	166	217	103	103	216	325	258	287	258	287	258	287	258	287	258	287	286	286
1959	112	214	164	219	45	45	222	299	270	290	270	290	270	290	270	290	246	246	289	289
1960	114	216	159	226	113	113	224	322	261	297	261	297	261	297	306	306	306	306	350	350
Per cent change from 1958																				
1959	0.9	0.5	-1.2	0.9	-56.3	2.8	-8.0	4.7	1.0	-1.6	1.0	-1.6	1.0	-1.6	1.0	-1.6	1.0	-1.6	1.0	1.0
1960	2.7	1.4	-4.2	4.1	29.1	3.7	-0.9	1.2	3.5	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

na Not available.

TABLE IV-G.-Total expense per patient-day of short-term general and other special hospitals in the United States, by service, with per cent change from 1958<sup>a</sup>

Year	U. S. Short-term		Fed.		Non-fed.		Psy.		Gen.		Mat.		EENT		Child-		Ortho.		All other	
	total	total	total	total	total	total	total	total	total	total	total	total	total	total	total	total	total	total	total	total
Total expense per patient-day																				
1957	13.48	26.02	na	na	na	18.48	na	33.02	31.48	34.43	30.92	0	31.48	34.43	30.92	0	31.48	34.43	30.92	0
1958	14.74	27.97	25.69	28.17	14.05	14.05	28.04	37.26	33.33	38.14	32.58	43.52	33.33	38.14	32.58	43.52	33.33	38.14	32.58	43.52
1959	15.65	29.41	27.34	29.61	6.73	6.73	29.95	35.85	36.27	39.92	33.84	45.11	36.27	39.92	33.84	45.11	36.27	39.92	33.84	45.11
1960	16.46	31.31	26.19	32.16	16.57	16.57	31.93	43.17	35.93	45.17	35.97	57.13	35.93	45.17	35.97	57.13	35.93	45.17	35.97	57.13
Per cent change from 1958																				
1959	6.2	5.1	6.4	5.1	-52.1	6.8	-3.8	8.8	4.7	3.9	3.9	3.7	8.8	4.7	3.9	3.9	8.8	4.7	3.9	3.7
1960	11.7	11.9	1.9	14.2	17.9	17.9	13.9	15.9	7.8	18.4	10.4	31.3	7.8	18.4	10.4	31.3	7.8	18.4	10.4	31.3

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

na Not available.

TABLE IV- H.-Total expense (in millions of dollars) of short-term general and other special hospitals in the United States, 1957-1960, by service, with per cent distribution and per cent change from 1958<sup>a</sup>

Year	U. S. total	Short-term total	Fed. total	Non-fed. total	Psy. total	Gen. total	Mat. total	EENT total	Child- ren's	Ortho.	All other
Total expense											
1957	na	4,161	na	na	13	na	18	14	47	10	36
1958	7,133	5,032	360	4,672	17	4,513	19	14	53	13	43
1959	7,789	5,571	451	5,120	29	4,932	22	15	65	6	52
1960	8,421	6,391	761	5,630	13	5,443	22	17	80	6	48
Per cent distribution											
1958		70.5	7.2	92.8	0.3	89.7	0.4	0.3	1.1	0.3	0.9
1959		71.5	8.1	91.9	0.5	88.5	0.4	0.3	1.2	0.1	0.9
1960		75.9	11.9	88.1	0.2	85.2	0.3	0.3	1.3	0.1	0.8
Per cent change from 1958											
1959	9.2	10.7	25.3	9.6	70.6	9.3	15.8	7.1	22.6	-54.0	20.9
1960	18.1	27.0	111.4	20.5	-23.5	20.6	15.8	21.4	50.9	-54.0	11.6

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958 and 1961).

na Not available.



TABLE IV-I.-Influences of several factors causing increases in total payroll expense

Price Level

The consumer price index for all items in 1946 was 83.4, while in 1960 it was 126.5. Expressed in an equation,  $\frac{126.5}{83.4} = 1.517$ . Dividing the payroll expense of 1960 -- \$3,499,472,000 -- by 1.517 results in a total payroll of \$2,306,837,000 in 1946 dollars. The difference of \$1,192,635,000, then, is the increase resulting from price level changes.

Increased Number of Patients

The payroll expense per patient-day in 1946 was \$4.98 and the total number of patient-days was 124,343,000. Patient-days were determined by dividing total payroll expense -- \$619,228,000 -- by \$4.98. In 1960, patient-days had increased to 174,277,000 -- \$3,499,472,000/\$20.08. If payroll expense per patient-day had remained constant, there would have been an increase in total payroll expense of  $(174,277,000 - 124,343,000) \$4.98 = \$248,671,000$ .

Increased Number of Employees Per Patient

The number of employees per patient increased from 1.48 in 1946 to 2.26 in 1960. The patient-day payroll expense which would have resulted had there been no other changes amounts to  $226/148 (\$4.98) = \$7.605$ . Multiplying the total number of patient-days -- 174,277,000 -- by the increase in expense  $(\$7.605 - \$4.980)$  produces \$457,477,000.

Improvement in Wages

This effect is a residual obtained by subtracting all the other effects from total payroll in 1960.



TABLE IV-J.-Payroll expense (in millions of dollars) of short-term general and other special hospitals in the United States, 1957-1960, by service, with per cent distribution and per cent change from 1958<sup>a</sup>

Year	U. S. total	Short-term total	Fed. total	Non-fed. total	Psy.	Gen.	Mat.	EENT	Child- ren's	Ortho.	All other
Payroll expense											
1957	na	2,516	na	na	7	na	12	8	30	6	22
1958	4,660	3,125	284	2,841	10	2,740	13	8	33	8	28
1959	5,158	3,541	360	3,181	18	3,060	15	9	42	4	34
1960	5,588	4,122	614	3,508	8	3,389	15	11	51	4	31
Per cent distribution											
1958		67.1	9.1	90.9	0.3	87.7	0.4	0.3	1.1	0.3	0.9
1959		68.7	10.2	89.8	0.5	86.4	0.4	0.3	1.2	0.1	1.0
1960		73.8	14.9	85.1	0.2	82.2	0.4	0.3	1.2	0.1	0.8
Per cent change from 1958											
1959	10.7	13.3	26.8	12.0	85.5	11.7	15.3	8.6	25.7	-56.4	18.4
1960	19.9	31.9	116.2	23.5	-16.4	23.7	17.6	26.1	52.6	-56.4	8.1

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

na Not available.

TABLE IV-K.-Payroll expense per patient-day of short-term general and other special hospitals in the United States, 1957-1960, by service, with per cent change from 1958<sup>a</sup>

Year	U. S. total	Short-term total	Fed. total	Non-fed. total	Psy.	Gen.	Mat.	EENT	Child- ren's	Ortho.	All other
Payroll expense per patient-day											
1957	8.76	na	na	na	9.76	na	21.20	18.78	21.87	19.51	30.81
1958	9.62	17.37	20.24	17.13	8.31	17.02	25.21	19.58	23.80	20.91	28.79
1959	10.37	18.70	21.81	18.40	4.31	18.59	23.99	21.33	25.76	20.65	29.17
1960	10.92	20.19	21.15	20.04	10.25	19.88	28.79	22.08	28.64	23.22	36.09
Per cent change from 1958											
1959	7.7	7.7	7.8	7.4	-48.1	9.2	-4.8	8.9	8.2	-1.2	1.3
1960	13.4	16.2	4.5	17.0	23.3	16.8	14.2	12.8	20.3	11.0	25.4

<sup>a</sup> Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

na Not available.

TABLE IV-L.-Total revenue (in thousands of dollars) of voluntary and proprietary short-term general and other special hospitals in the United States, and total revenue per patient-day, 1946-1960<sup>a</sup>

Year	Voluntary	Proprietary
	Total revenue	
1946	885,037	105,382
1947	1,072,049	116,640
1948	1,269,256	127,376
1949	1,379,108	138,143
1950	1,538,923	156,047
1951	1,745,669	155,466
1952	1,938,352	na
1953	2,144,325	184,040
1954	2,330,005	176,290
1955	2,545,763	192,108
1956	2,880,369	209,570
1957	3,157,664	218,431
1958	3,538,315	241,065
1959	3,836,433	258,928
1960	4,255,343	293,482
Revenue per patient-day		
1946	10.48	11.40
1947	12.05	12.62
1948	14.12	14.76
1949	15.66	16.42
1950	17.06	16.68
1951	18.62	17.41
1952	20.17	na
1953	21.75	20.45
1954	23.31	21.50
1955	24.51	23.49
1956	26.28	24.84
1957	27.75	25.67
1958	30.19	28.07
1959	31.79	30.21
1960	34.16	33.18

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.



TABLE IV-M.-Total revenue (in millions of dollars) of voluntary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & Over
Total revenue												
1946	885								50	114	379	342
1947	1,072								60	145	471	395
1948	1,269								61	155	514	539
1949	1,379								80	179	570	550
1950	1,539								81	196	649	614
1951	1,746								89	218	728	711
1952	1,938					508	464	233	98	238	798	804
1953	2,144	18	83	256	583							
1954	2,330	19	90	255	629	555	538	244				
1955	2,546	25	94	273	670	621	596	266				
1956	2,880	26	103	315	721	703	695	318				
1957	3,158	23	119	348	789	765	769	345				
1958	3,538	33	136	383	854	843	873	416				
1959	3,836	na	na	na	na	na	na	na				
1960	na	na	na	na	na	na	na	na				
Per cent distribution												
1946									5.6	12.9	42.8	38.6
1947									5.6	13.5	43.9	36.8
1948									4.8	12.2	40.5	42.5
1949									5.8	13.0	41.3	39.9
1950									5.3	12.7	42.2	39.9
1951									5.1	12.5	41.7	40.7
1952									5.1	12.3	41.2	41.5

TABLE IV-M.-Continued

1953	0.7	3.9	11.9	27.2	23.7	21.6	10.9
1954	0.8	3.9	10.9	27.0	23.8	23.1	10.5
1955	1.0	3.7	10.7	26.3	24.4	23.4	10.4
1956	0.9	3.6	10.9	25.0	24.4	24.1	11.0
1957	0.7	3.8	11.0	25.0	24.2	24.4	10.9
1958	0.9	3.8	10.8	24.1	23.8	24.7	11.8
1959	na	na	na	na	na	na	na
1960	na	na	na	na	na	na	na
Per cent change from 1946 and 1953							
1946	0.0				0.0	0.0	0.0
1947	21.1				21.6	27.4	24.2
1948	43.4				22.3	36.2	35.5
1949	55.8				61.0	57.0	50.4
1950	73.9				62.3	71.4	71.1
1951	97.2				79.6	90.7	91.9
1952	119.0				98.1	108.8	110.4
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1954	8.7	5.5	8.7	7.9	9.3	15.9	4.7
1955	18.8	39.5	13.3	14.9	22.2	28.4	14.2
1956	34.3	41.7	24.7	23.7	38.4	49.8	36.5
1957	47.3	26.7	43.2	35.3	50.6	65.7	48.7
1958	65.0	80.9	63.6	46.5	65.9	88.1	78.5
1959	78.9	na	na	na	na	na	na
1960	na	na	na	na	na	na	na

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.

TABLE IV-N.-Total revenue (in millions of dollars) of proprietary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	500 & over
Total revenue												
1946	105								45	29	25	6
1947	117								58	27	28	4
1948	127								59	35	32	1
1949	138								71	36	30	1
1950	156								75	45	35	1
1951	155								77	44	29	5
1952	na								82	48	37	na
1953	184	30	60	49	45 <sup>b</sup>							
1954	176	30	55	47	44 <sup>b</sup>							
1955	192	30	64	48	50 <sup>b</sup>							
1956	210	30	70	49	61 <sup>b</sup>							
1957	218	29	64	60	50	12	0.0	4				
1958	241	na	na	na	na	na	na	na				
1959	259	na	na	na	na	na	na	na				
1960	na	na	na	na	na	na	na	na				
Per cent distribution												
1946									43.1	27.8	23.5	5.6
1947									49.7	22.8	24.2	3.3
1948									46.3	27.2	25.5	1.0
1949									51.4	25.8	21.8	1.0
1950									48.2	28.6	22.6	0.7
1951									49.8	28.0	18.7	3.5
1952									na	na	na	na





TABLE IV-O.-Total revenue per patient-day of proprietary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total revenue per patient-day												
1946	11.40								11.17	11.45	11.46	12.77
1947	12.62								13.09	11.27	13.12	12.63
1948	14.76								13.87	14.83	16.47	18.90
1949	16.42								15.46	17.38	17.86	16.39
1950	16.68								16.92	17.39	17.10	18.00
1951	17.41								17.42	18.71	15.75	17.40
1952	na								19.32	20.73	19.49	na
1953	20.45	19.23	20.97	20.81	20.23 <sup>b</sup>							
1954	21.50	20.92	21.48	21.76	21.66 <sup>b</sup>							
1955	23.49	22.92	24.74	22.92	22.91 <sup>b</sup>							
1956	24.84	23.76	27.13	23.62	24.06 <sup>b</sup>							
1957	25.67	24.45	25.31	26.96	25.45	24.63	0	27.65				
1958	28.02	na	na	na	na	na	na	na				
1959	30.21	na	na	na	na	na	na	na				

TABLE IV-O.-Continued

Per cent change from 1946 and 1953									
1947						17.2	-1.6	14.5	-1.1
1948						24.2	29.5	43.7	48.0
1949						38.4	51.8	55.8	28.3
1950						51.5	51.9	49.2	41.0
1951						56.0	63.4	37.4	36.3
1952						73.0	81.0	70.1	na
1953	0.0	0.0	0.0	0.0	0.0				
1954	5.1	8.8	2.4	4.6	7.1 <sup>b</sup>				
1955	14.9	19.2	18.0	10.1	13.2 <sup>b</sup>				
1956	21.5	23.6	29.4	13.5	18.9 <sup>b</sup>				
1957	25.5	27.1	20.7	29.6	25.8 <sup>b</sup>				
1958	37.0	na	na	na	na				
1959	47.7	na	na	na	na				
1960	na	na	na	na	na				

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961.).

<sup>b</sup>Refers to the size class 100 and over.

na Not available.



TABLE IV-P.-Total revenue per patient-day of voluntary short-term general and other special hospitals in the United States, by size, with per cent change from 1946 to 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total revenue per patient-day												
1946	10.48								9.16	9.20	10.47	11.25
1947	12.05								10.43	10.78	12.18	12.73
1948	14.12								10.84	11.96	13.29	16.50
1949	15.66								14.42	14.20	14.84	17.47
1950	17.06								15.36	15.46	16.91	18.09
1951	18.62								15.37	16.42	18.52	20.09
1952	20.17								16.91	17.89	20.03	21.65
1953	21.75	17.15	18.10	19.49	21.31	22.77	22.23	25.01				
1954	23.31	17.89	19.09	20.57	22.63	24.55	24.42	26.15				
1955	24.51	24.59	20.26	21.34	23.87	25.73	25.55	27.02				
1956	26.28	24.74	21.38	22.87	25.37	27.67	27.61	28.95				
1957	27.75	22.26	23.14	24.87	27.31	28.83	28.88	29.75				
1958	30.19	33.48	25.93	26.99	29.26	31.24	31.49	32.33				
1959	31.79	na	na	na	na	na	na	na				
1960	na	na	na	na	na	na	na	na				

TABLE IV-P.-Continued

Per cent change from 1946 and 1953											
1947								13.9	17.2	16.3	13.2
1948								18.3	30.0	26.9	46.7
1949								57.4	54.3	41.7	55.3
1950								67.7	68.0	61.5	60.8
1951								67.8	78.5	76.9	78.6
1952								84.6	94.5	91.3	92.4
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
1954	7.2	4.3	5.5	6.2	7.8	9.9	4.6				
1955	12.7	43.4	11.9	12.0	13.0	14.9	8.0				
1956	20.8	44.3	18.1	19.1	21.5	24.2	15.8				
1957	27.6	29.8	27.8	28.2	26.6	29.9	19.0				
1958	38.8	95.2	43.3	37.3	37.2	41.7	29.3				
1959	46.2	na	na	na	na	na	na				
1960	na	na	na	na	na	na	na				

<sup>a</sup> Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.

TABLE IV-Q.-Total patient revenue (in thousands of dollars) of voluntary and proprietary short-term general and other special hospitals in the United States, and total patient revenue per patient-day of voluntary and proprietary hospitals, 1946-1960<sup>a</sup>

Year	Voluntary Total patient revenue	Proprietary
1946	739,408	98,687
1947	952,125	110,363
1948	1,110,776	121,248
1949	1,195,243	126,992
1950	1,369,390	151,225
1951	1,551,417	151,095
1952	1,739,724	na
1953	1,921,429	179,517
1954	2,106,194	171,576
1955	2,326,075	186,096
1956	2,634,664	200,023
1957	2,878,254	209,990
1958	3,277,242	234,355
1959	3,557,926	254,098
1960	3,925,200	286,394
Total patient revenue per patient-day		
1946	8.76	10.67
1947	10.70	11.94
1948	12.35	14.05
1949	13.58	15.10
1950	15.18	16.16
1951	16.55	16.92
1952	18.10	na
1953	19.49	19.94
1954	21.07	20.93
1955	22.40	22.76
1956	24.04	23.71
1957	25.29	24.67
1958	27.96	27.24
1959	29.49	29.65
1960	31.51	32.38

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961.)

na Not available.



TABLE IV-R.-Total patient revenue (in millions of dollars) of voluntary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	500 & over
Total patient revenue												
1946	739								41	97	325	276
1947	952								54	132	423	343
1948	1,111								55	143	461	451
1949	1,195								59	158	515	463
1950	1,369								71	176	587	535
1951	1,551								81	196	656	618
1952	1,740								90	218	727	705
1953	1,921	16	77	233	533	453	415	194				
1954	2,106	17	84	233	578	504	487	203				
1955	2,326	22	86	252	617	575	547	227				
1956	2,635	22	95	290	655	651	639	273				
1957	2,878	19	109	319	724	706	700	301				
1958	3,277	30	126	358	797	789	806	372				
1959	3,558	na	na	na	na	na	na	na				
1960	na	na	na	na	na	na	na	na				
Per cent distribution												
1946									5.6	13.2	44.0	37.3
1947									5.7	13.8	44.5	36.0
1948									5.0	12.9	41.5	40.6
1949									4.9	13.2	43.1	38.7
1950									5.2	12.9	42.9	39.1
1951									5.2	12.6	42.3	39.8
1952									5.2	12.5	41.8	40.5



TABLE IV-S.-Total patient revenue (in millions of dollars) of proprietary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent distribution and per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total patient revenue												
1946	99								42	28	23	5
1947	110		58	48	44 <sup>b</sup>				56	25	27	3
1948	121		54	46	43 <sup>b</sup>				56	35	29	1
1949	127		62	47	48 <sup>b</sup>				64	33	29	1
1950	151		67	47	58 <sup>b</sup>				73	43	34	1
1951	151		62	58	48	11	0	3	75	42	28	5
1952	na								80	46	35	na
1953	180	29										
1954	172	29										
1955	186	29										
1956	200	29										
1957	210	27										
1958	234	na										
1959	254	na										
1960	na	na										
Per cent distribution												
1946									42.9	28.7	23.0	5.4
1947									50.3	22.4	24.1	3.2
1948									46.5	28.5	24.1	1.0
1949									50.1	26.2	22.8	1.0
1950									48.4	28.2	22.7	0.7
1951									49.8	28.1	18.5	3.6
1952									na	na	na	na





TABLE IV-T.-Total patient revenue per patient-day of voluntary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent change from 1946 and 1953<sup>a</sup>

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total patient revenue per patient-day												
1946	8.76								7.57	7.87	8.97	9.07
1947	10.70								9.34	9.77	10.95	11.05
1948	12.35								9.87	11.02	11.93	13.81
1949	13.58								10.63	12.56	13.39	14.73
1950	15.18								13.55	13.93	15.30	15.76
1951	16.55								13.95	14.81	16.69	17.47
1952	18.10								15.53	16.34	18.25	18.98
1953	19.49	15.49	16.71	17.77	19.49	20.31	19.90	20.85				
1954	21.07	15.89	17.72	18.79	20.81	22.31	22.11	21.75				
1955	22.40	21.60	18.51	19.67	21.98	23.81	23.45	23.08				
1956	24.04	21.61	19.55	21.09	23.41	25.63	25.37	24.83				
1957	25.29	18.72	21.23	22.75	25.07	26.60	26.32	25.94				
1958	27.96	30.65	24.06	25.21	27.28	29.21	29.08	28.91				
1959	29.49	na	na	na	na	na	na	na				
1960	na	na	na	na	na	na	na	na				

TABLE IV-T.-Continued

Per cent change from 1946 and 1953												
1947									23.4	24.1	22.1	21.8
1948									30.4	40.0	33.0	52.3
1949									40.4	59.6	49.3	62.4
1950									79.0	77.0	70.6	73.8
1951									84.3	88.2	86.1	92.6
1952									105.2	107.7	103.5	109.3
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
1954	8.1	2.6	6.0	5.7	6.8	9.8	11.1	4.3				
1955	14.9	39.4	10.8	10.7	12.8	17.2	17.8	10.7				
1956	23.3	39.5	17.0	18.7	20.1	26.2	27.5	19.1				
1957	29.8	20.9	27.0	28.0	28.6	31.0	32.3	24.4				
1958	43.5	97.9	44.0	41.9	40.0	43.8	46.1	38.7				
1959	51.3	na	na	na	na	na	na	na				
1960	na	na	na	na	na	na	na	na				

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

na Not available.



TABLE IV-U.-Total patient revenue per patient-day of proprietary short-term general and other special hospitals in the United States, 1946-1960, by size, with per cent change from 1946 and 1953a

Year	Total	Under 25 bds	25- 49	50- 99	100- 199	200- 299	300- 499	500 & over	Under 50 bds	50- 99	100- 249	250 & over
Total patient revenue per patient-day												
1946	10.67								10.42	11.04	10.51	11.64
1947	11.94								12.54	10.46	12.38	11.49
1948	14.05								13.27	14.77	14.79	17.21
1949	15.10								13.85	16.23	17.12	14.91
1950	16.16								16.45	16.62	16.66	18.00
1951	16.92								16.93	18.23	15.18	17.40
1952	na								18.84	19.95	18.91	na
1953	19.94	18.73	20.40	20.37	19.73 <sup>b</sup>							
1954	20.93	20.17	20.93	21.26	21.11 <sup>b</sup>							
1955	22.76	22.20	24.07	22.43	21.85 <sup>b</sup>							
1956	23.71	22.67	26.00	22.73	22.70 <sup>b</sup>							
1957	24.67	23.55	24.53	25.97	24.33	23.71	0	24.11				
1958	27.24	na	na	na	na	na	na	na				
1959	29.65	na	na	na	na	na	na	na				
1960	na	na	na	na	na	na	na	na				

TABLE IV-U.-Continued

Per cent change from 1946 and 1953									
1947								20.3	-5.3
1948								17.8	-2.3
1949								40.7	47.9
1950								32.9	62.9
1951								58.3	28.1
1952								62.5	50.5
1953	0.0	0.0	0.0	0.0	0.0			44.4	65.1
1954	5.0	7.7	2.6	4.4	7.0 <sup>b</sup>			79.9	80.7
1955	14.1	18.5	18.0	10.1	10.7 <sup>b</sup>				
1956	18.9	21.0	27.5	11.6	15.1 <sup>b</sup>				
1957	23.7	25.7	20.2	27.5	23.3 <sup>b</sup>	na	na		
1958	36.6	na	na	na	na	na	na		
1959	48.7	na	na	na	na	na	na		
1960	na	na	na	na	na	na	na		

<sup>a</sup>Taken and calculated from: American Hospital Association, American Hospital Directory (Chicago: 1947 and 1948); and, American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1949-1961).

<sup>b</sup>Refers to the size class 100 and over.

na Not available.

## TABLE IV-V.-Questionnaire form for annual hospital survey

ANNUAL SURVEY OF HOSPITALS ACCEPTED FOR REGISTRATION  
AMERICAN HOSPITAL ASSOCIATION 1963

Detailed instructions for completion are enclosed. Except where indicated, report ALL data for a 12-month period, preferably ending September 30, 1963, but not later than October 31, 1963. Indicate period used:

Beginning date \_\_\_\_\_ Ending date \_\_\_\_\_ Number of days \_\_\_\_\_

## A. HOSPITAL IDENTIFICATION

1. Complete name of hospital \_\_\_\_\_
2. Street address \_\_\_\_\_
3. City and county \_\_\_\_\_
4. Area code \_\_\_\_\_ Telephone number \_\_\_\_\_
5. Administrator's name and title \_\_\_\_\_

## B. ADMINISTRATIVE RELATIONSHIPS

1. Is your hospital administratively responsible for other than the institution indicated in A above? Yes \_\_\_\_\_ No \_\_\_\_\_ If "Yes", give name and location \_\_\_\_\_
2. Is your hospital administered by a hospital not indicated in A above? Yes \_\_\_\_\_ No \_\_\_\_\_ If "Yes", give name and location \_\_\_\_\_
3. If answer to 1 or 2 is "Yes", give name of institution for which data are reported on this form \_\_\_\_\_
4. Is your hospital part of a larger nonhospital institution (e.g. college, prison)? Yes \_\_\_\_\_ No \_\_\_\_\_

## C. CLASSIFICATION

1. Type of organization operating hospital (check one only):
 

Nonprofit	Proprietary
___ Church related or operated	___ Individual
___ Other nonprofit	___ Partnership
	___ Corporation (for profit)
Governmental, federal	Governmental, nonfederal
___ Air Force	___ State
___ Army	___ County
___ Navy	___ City or Municipal
___ Public Health Service	___ City-County
___ Veterans Administration	___ Hospital District
___ Other Federal	



TABLE IV-V.-Continued

## 2. Predominant type of stay and service (check one only):

- a. ☐ Short-term care, not limited to definite specialty or disease.  
 b. ☐ Short-term care, limited to definite specialty or disease.  
     Specify limitation (s) \_\_\_\_\_  
 c. ☐ Long-term care, not limited to definite specialty or disease.  
 d. ☐ Long-term care, limited to definite specialty or disease.  
     Specify limitation (s) \_\_\_\_\_

## D. FACILITIES, SERVICE S, AND PROGRAMS

## 1. Check each item below either YES or NO. Indicate YES only if the facility or service is actually within the hospital.

YES NO

- |                              |                          |   |
|------------------------------|--------------------------|---|
| 1. <input type="checkbox"/>  | <input type="checkbox"/> | Blood bank                              |
| 2. <input type="checkbox"/>  | <input type="checkbox"/> | Clinical laboratory                     |
| 3. <input type="checkbox"/>  | <input type="checkbox"/> | Pathology laboratory (with pathologist) |
| 4. <input type="checkbox"/>  | <input type="checkbox"/> | Electrocardiography                     |
| 5. <input type="checkbox"/>  | <input type="checkbox"/> | Electroencephalography                  |
| 6. <input type="checkbox"/>  | <input type="checkbox"/> | Dental facilities                       |
| 7. <input type="checkbox"/>  | <input type="checkbox"/> | Pharmacy (with registered pharmacist)   |
| 8. <input type="checkbox"/>  | <input type="checkbox"/> | Occupational therapy dept.              |
| 9. <input type="checkbox"/>  | <input type="checkbox"/> | Physical therapy dept.                  |
| 10. <input type="checkbox"/> | <input type="checkbox"/> | Premature nursery                       |
| 11. <input type="checkbox"/> | <input type="checkbox"/> | Intensive care unit                     |
| 12. <input type="checkbox"/> | <input type="checkbox"/> | Organized outpatient dept.              |
| 13. <input type="checkbox"/> | <input type="checkbox"/> | Emergency dept.                         |
| 14. <input type="checkbox"/> | <input type="checkbox"/> | Home care program                       |
| 15. <input type="checkbox"/> | <input type="checkbox"/> | Operating room                          |
| 16. <input type="checkbox"/> | <input type="checkbox"/> | Obstetrical delivery room               |
| 17. <input type="checkbox"/> | <input type="checkbox"/> | Postoperative recovery room             |
| 18. <input type="checkbox"/> | <input type="checkbox"/> | Medical social service dept.            |
| 19. <input type="checkbox"/> | <input type="checkbox"/> | X-ray, diagnostic                       |
| 20. <input type="checkbox"/> | <input type="checkbox"/> | X-ray, therapeutic                      |
| 21. <input type="checkbox"/> | <input type="checkbox"/> | Chest x-ray on admission                |
| 22. <input type="checkbox"/> | <input type="checkbox"/> | Radioactive isotope facility            |
| 23. <input type="checkbox"/> | <input type="checkbox"/> | Organized hospital auxiliary            |
| 24. <input type="checkbox"/> | <input type="checkbox"/> | Chapel or prayer room                   |
| 25. <input type="checkbox"/> | <input type="checkbox"/> | Psychiatric inpatient care unit         |
| 26. <input type="checkbox"/> | <input type="checkbox"/> | Cobalt and radium therapy               |
| 27. <input type="checkbox"/> | <input type="checkbox"/> | Rehabilitation unit                     |
| 28. <input type="checkbox"/> | <input type="checkbox"/> | Family planning service                 |

## 2. Check if any of the following service are provided by outside firms or as a part of a cooperative venture with other organizations:

29. ☐ Laundry (service provided by outside firms)  
 30. ☐ Laundry (service provided by cooperative venture)

## TABLE IV-V.-Continued

31. \_\_\_\_ Dietary (service provided by outside firms)  
 32. \_\_\_\_ Housekeeping (service provided by outside firms)

## E. BEDS AND BASSINETS (see instructions for inclusions and exclusions)

1. a. Adult and pediatric bed capacity (set up and staffed for use as of reporting date) \_\_\_\_\_  
 b. Newborn bed capacity (set up and staffed for use as of reporting date) \_\_\_\_\_  
 2. Has your hospital had a permanent change, or a significant temporary change, in the number of beds set up and staffed for use during the reporting period? Yes \_\_\_\_ No \_\_\_\_ If "Yes", give date and details such as number of beds involved and whether used for adult or new-born.  
 Date \_\_\_\_\_ Details \_\_\_\_\_

## F. UTILIZATION (for the reporting period)

1. Inpatient (adult and pediatric)  
 a. Number of adult and pediatric admissions (exclude newborn) \_\_\_\_\_  
 b. Total adult and pediatric inpatient days (exclude newborn days) \_\_\_\_\_  
 c. Number of adult and pediatric discharges (include deaths, but exclude transfers) \_\_\_\_\_  
 d. Total days of care rendered to discharged adult and pediatric patients \_\_\_\_\_  
 2. Inpatient (newborn)  
 a. Total births (exclude fetal deaths) \_\_\_\_\_  
 b. Total newborn days \_\_\_\_\_  
 3. Outpatient  
 a. Emergency \_\_\_\_\_ b. Clinic \_\_\_\_\_ c. Referred \_\_\_\_\_ d. Total \_\_\_\_\_

## G. LONG-TERM AND SHORT-TERM INPATIENT CARE UNITS

1. If the predominant characteristic of the hospital is short-term (section C.2) and the hospital maintains a separate unit for long-term patients, i.e., separate wing, floor, ward, or rooms, complete the following for the reporting period:  
 a. Number of admissions to long-term unit \_\_\_\_\_  
 b. Total number of patient days in long-term unit \_\_\_\_\_  
 c. Number of discharges from long-term unit \_\_\_\_\_  
 d. Total days of care rendered to discharged patients in long-term unit \_\_\_\_\_  
 e. Bed capacity for long-term unit (set up and staffed for use as of reporting date) \_\_\_\_\_  
 2. If the predominant characteristic of the hospital is long-term (section C.2) and the hospital maintains a separate unit for short-term patients, i.e., separate wing, floor, ward, or rooms, complete the following



TABLE IV-V.-Continued

following for the reporting period:

- a. Number of admissions to short-term unit \_\_\_\_\_
- b. Total number of patient days in short-term unit \_\_\_\_\_
- c. Number of discharges from short-term unit \_\_\_\_\_
- d. Total days of care rendered to discharged patients in short-term unit \_\_\_\_\_
- e. Bed capacity for short-term unit (set up and staffed for use as of reporting date) \_\_\_\_\_

#### H. FINANCES (for the reporting period)

##### 1. Revenue

- a. Net revenue from service to patients

1) Inpatient \$ \_\_\_\_\_

2) Outpatient \_\_\_\_\_

3) Total (1+2) \$ \_\_\_\_\_

- b. Other revenue \_\_\_\_\_

c. Total (a.3 + b) \$ \_\_\_\_\_

##### 2. Expenses

	Salary/Wages	Other	Total
a. Administrative and General	\$ _____	\$ _____	\$ _____
b. Dietary	_____	_____	_____
c. Household and Property	_____	_____	_____
d. Professional Care of Patients (Inpatient and Outpatient)	_____	_____	_____
e. Other (include depreciation)	_____	_____	_____
f. Total (a+b+c+d+e)	_____	_____	_____

##### 3. Assets as of end of reporting period (exclude "Due from funds"):

- a. Plant (include land, building, equipment, and reserves for construction, improvement, and replacement--less deduction for depreciation) \$ \_\_\_\_\_

- b. All other (include endowment fund principal and general and temporary fund balances) \_\_\_\_\_

c. Total (a+b) \_\_\_\_\_

#### I. PERSONNEL (as of the payroll period in which ending date of reporting period falls)

- 1. Number of regularly employed personnel, excluding trainees, private duty nurses, and volunteers:

	Full-time	Part-time
a. Administrative and General	_____	_____
b. Dietary	_____	_____
c. Household and Property	_____	_____
d. Professional Care of Patients (Inpatient and Outpatient)	_____	_____
e. Other	_____	_____
f. Total (a+b+c+d+e)	_____	_____



TABLE IV-V.-Continued

## 2. Number of Trainees

a. Student Nurses \_\_\_\_\_

b. Interns and Residents \_\_\_\_\_

c. Others \_\_\_\_\_

d. Total (a+b+c) \_\_\_\_\_

## 3. Total number of shifts worked by all Private Duty Nurses during the entire last month of reporting period. \_\_\_\_\_

\_\_\_\_\_  
Date of Completion\_\_\_\_\_  
Signature and Title of Chief Administrative  
Officer

TABLE IV-W.-Plant assets (in millions of dollars) of short-term general and other special hospitals in the States, 1958-1960, by service, with per cent distribution and per cent change from 1958<sup>a</sup>

Year	U. S. total	Short-term total	Fed. total	Non-fed. total	Psy. total	Gen.	Mat.	EENT	Child- ren's	Ortho.	All other
Plant assets											
1958	12,748	7,797	679	7,118	34	6,837	24	18	90	27	88
1959	14,194	8,878	792	8,086	85	7,716	29	19	120	12	105
1960	14,743	9,690	1,379	8,311	19	8,000	33	22	137	12	88
Per cent distribution											
1958	61.2	61.2	8.7	91.3	0.4	87.7	0.3	0.2	1.2	0.3	1.1
1959	62.5	62.5	8.9	91.1	1.0	86.9	0.3	0.2	1.3	0.1	1.2
1960	65.7	65.7	14.2	85.8	0.2	82.6	0.3	0.2	1.4	0.1	0.9
Per cent change from 1958											
1959	11.3	13.9	16.6	13.6	152.7	12.9	20.8	4.1	33.1	-55.3	18.8
1960	15.6	24.3	103.1	16.8	-45.2	17.0	39.4	17.1	52.6	-54.8	-0.6

<sup>a</sup>Taken and calculated from: American Hospital Association, Hospitals, Journal of the American Hospital Association, Guide Issue (Chicago: 1958-1961).

TABLE IV-X.-Changes in plant assets (in millions of dollars) of short-term general and other special hospitals in the United States, by service, with per cent change from 1959

Year	U. S. total	Short-term total	Fed. total	Non-fed. total	Psy. total	Gen.	Mat.	EENT	Child- ren's	Ortho.	All other
Annual changes in plant assets											
1959	1,447	1,081	113	968	52	879	5	1	30	-15	17
1960	549	811	587	225	-67	283	4	2	17	a	-17
Per cent change from 1959											
1959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1960	-62.1	-24.9	418.1	-76.8	-229.6	-67.8	-10.2	217.6	-41.4	101.0	-203.0

<sup>a</sup>Less than one.





TABLE IV-Z.-Index of amount of total assets (1947-1949=100) of short-term general and other special hospitals in the United States, 1947-1960, by control

Year	Total	Voluntary	Proprietary	Governmental
1947	93.2	93.2	97.9	92.3
1948	100.2	99.8	102.7	101.7
1949	106.6	107.1	99.4	105.9
1950	117.8	115.7	104.5	129.8
1951	122.4	119.5	106.6	138.5
1952	139.2	134.7	111.6	164.4
1953	155.5	150.2	109.7	187.9
1954	167.4	162.6	109.7	199.6
1955	189.3	180.4	112.2	243.4
1956	204.2	198.3	131.1	244.5
1957	238.6	224.6	227.4	300.1
1958	255.2	249.4	166.0	298.6
1959	275.1	269.6	171.5	319.9
1960	294.2	290.9	183.8	330.8

## APPENDIX V

TABLE V-A.-Standard error of the forecast

Standard error of the forecast, unadjusted data

$$S^2_{x_{1.2345} - x_1} = \bar{S}^2_{1.2345} \left( 1 + \frac{1}{n} + c_{22}x_2^2 + c_{33}x_3^2 + c_{44}x_4^2 + c_{55}x_5^2 + 2c_{23}x_2x_3 + 2c_{24}x_2x_4 + 2c_{25}x_2x_5 + 2c_{34}x_3x_4 + 2c_{45}x_4x_5 \right)$$

Substituting in the equation and simplifying:

$$S^2_{x_{1.2345} - x} = 4850.7921 - 2664.7993x_2^2 + 29.5731x_3^2 + .0291x_4^2 + 1031.8651x_5^2 - 218.0935x_2x_3 - 12.6349x_2x_4 - 2305.4561x_2x_5 - 0.1751x_3x_4 + 84.5803x_3x_5 + 1.2567x_4x_5$$

where:  $X_2$  - population per square mile

$X_3$  - per cent of population having hospital insurance

$X_4$  - median income

$X_5$  - employment (in millions)

Standard error of the forecast, adjusted data

$$S^2_{x_{1.2345} - x} = 1422.4208 + 4635802x_2^2 + 8.6410x_3^2 + 0.0109x_4^2 + 305.6332x_5^2 - 71.1454x_2x_3 - 1.9108x_2x_4 - 547.5912x_2x_5 - .0449x_3x_4 + 27.0497x_3x_5 - 0.5532x_4x_5$$



## APPENDIX VI

TABLE VI-A.-Index of median income per spending unit of professional and unskilled workers (1947-49=100)

Year	Professional	Unskilled	Total
1946	--	--	--
1947	102.6	107.3	105.0
1948	96.7	94.0	95.4
1949	100.7	98.8	99.8
1950	106.0	102.9	104.5
1951	113.3	101.9	107.6
1952	125.5	110.4	118.0
1953	127.8	111.5	119.7
1954	138.9	120.8	129.9
1955	153.2	133.6	143.4
1956	146.2	125.7	136.0
1957	153.4	127.4	140.4
1958	155.6	125.8	140.7
1959	160.4	128.5	145.0
1960	171.1	135.1	153.1

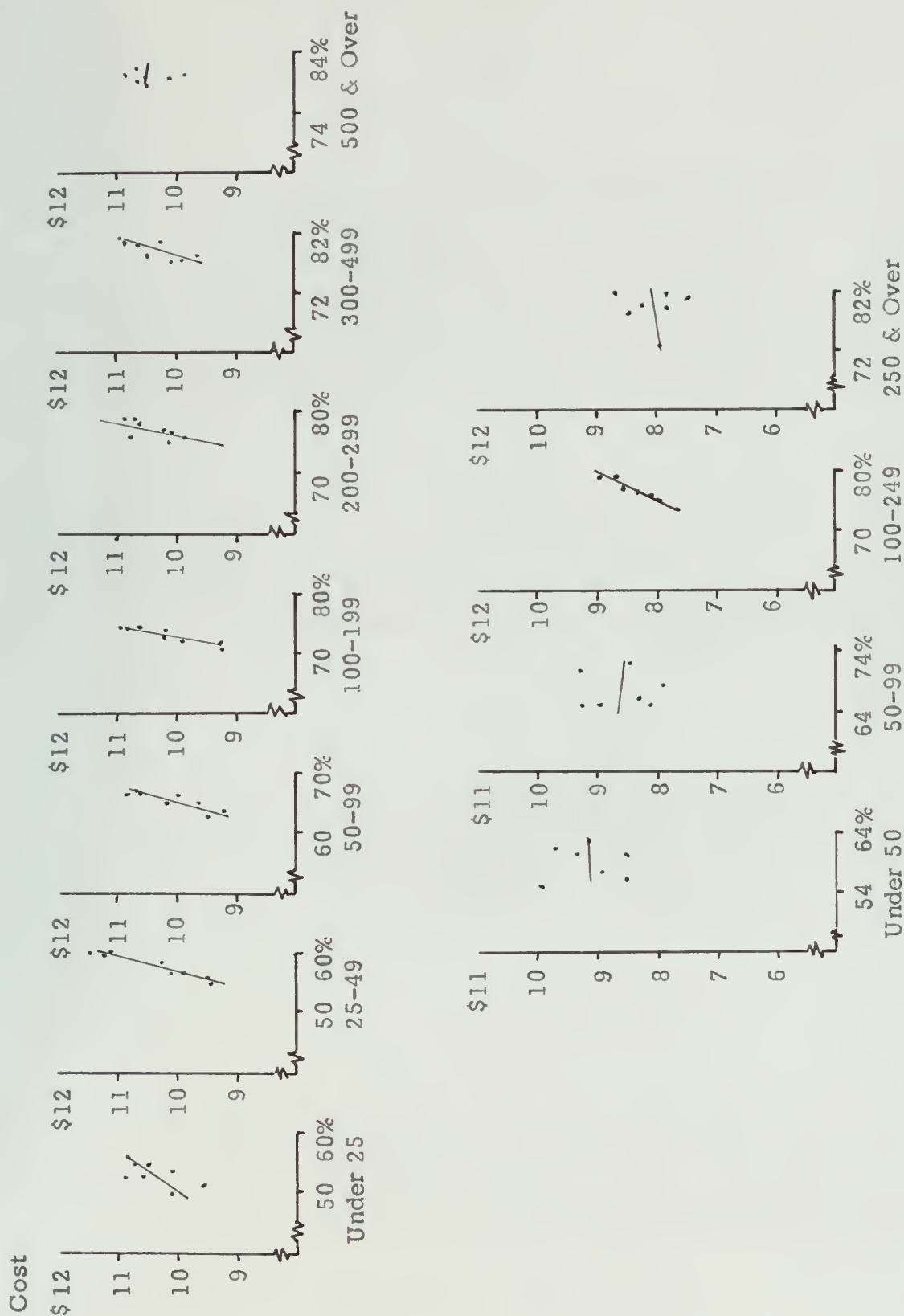


Figure VI-A.--Scatter Diagrams of Adjusted Total Costs per Patient-day and Occupancy Percentage,  
All Sizes Corrected for Time



## SELECTED BIBLIOGRAPHY

## Books

Accredited Hospitals - December 31, 1960. Chicago: Joint Committee on Accreditation of Hospitals.

American Hospital Directory. Chicago: American Hospital Association, 1947 and 1948.

Arkin, Herbert and Colton, Raymond R. Tables for Statisticians. New York: Barnes and Noble, Inc., 1961.

\_\_\_\_\_. Statistical Methods as Applied to Economics, Business, Psychology, Education, and Biology. 4th ed. revised. New York: Barnes and Noble, Inc., 1956.

Arnow, Kathryn Smul. The Attack on the Cost of Living Index. New York: The Inter-University Case Program, printed by Polygraphic Company of America, Inc., 1952.

Bedell, Mary S. The Consumer Price Index: A Layman's Guide. U. S. Department of Labor, Bureau of Labor Statistics, Bulletin No. 1140. Washington: Government Printing Office, 1953.

Blodgett, Ralph H. Our Expanding Economy. New York: Rinehart and Company, Inc., 1955.

Bost, Howard Lee. An Analysis of Charges Incurred for In-patient Care in General Hospital; Implications for Protection Against the Cost of Hospital Care. Doctoral Dissertation Series, Publication No. 19,683. Ann Arbor, Michigan: University Microfilms, 1957.

Brennan, Michael J. Preface to Econometrics. Cincinnati: Southwestern Publishing Co., 1960.

Bukacek, R. F. and Galle, W. J. Stepwise Multiple Linear Regression. Program 1620 - 06.0.006. I.B.M. General Program Library. 1961. (Mimeographed.)

Commission on the Cost of Medical Care. The Report of the Commission on the Cost of Medical Care. Vol. I: General Report. Vol. IV: Changing Patterns of Hospital Care. 4 vols. American Medical Association, 1964, n.p.

Croxton, Frederick E. and Cowden, Dudley J. Practical Business Statistics. 3rd. ed. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1960.

- Dean, Joel. Managerial Economics. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1951.
- Ezekial, Mordecai and Fox, Karl A. Methods of Correlation and Regression Analysis. 3rd. ed. New York: John Wiley and Sons, Inc., 1961.
- Faulkner, E. J. Appendices in connection with "Statement on Proposed Social Security Amendments on Behalf of the Health Insurance Association of America Before the Ways and Means Committee, U. S. House of Representatives, June 24, 1958." New York: Health Insurance Association of America. (Mimeographed.)
- Faxon, Nathaniel. (ed.) The Hospital in Contemporary Life. Cambridge, Mass.: Harvard University Press, 1949.
- Feldstein, Paul J. An Empirical Investigation of the Marginal Cost of Hospital Services. Chicago: Graduate Program in Hospital Administration, University of Chicago, 1961.
- Fisher, Ronald A. Statistical Methods for Research Workers. 13th ed. New York: Hafner Publishing Co., Inc., 1958.
- \_\_\_\_\_. Statistical Methods and Scientific Inference. 2nd. ed. revised. New York: Hafner Publishing Co., Inc., 1959.
- Goldwater, S. S. On Hospitals. New York: The MacMillan Co., 1947.
- Goode, William J. and Hatt, Paul K. Methods in Social Research. New York: McGraw-Hill Book Co., Inc., 1952.
- Hayes, John H. (ed.) Factors Affecting the Costs of Hospital Care. Vol. I of the Report of The Commission on Financing of Hospital Care in the United States. 3 vols. New York: The Blakiston Co., Inc., 1954.
- Hess, Irene, et. al. Probability Sampling of Hospitals and Patients. Ann Arbor, Michigan: University of Michigan, 1961.
- Hodgman, Charles D. (ed.) C. R. C. Standard Mathematical Tables. 12th ed. Cleveland: Chemical Rubber Publishing Co., 1959.
- Hoel, Paul G. Introduction to Mathematical Statistics. 2nd ed. New York: John Wiley and Sons, Inc., 1958.



- Ingbar, Mary Lee. A Statistical Study of Differences in Hospital Costs: Cost Functions for 72 Massachusetts Hospitals. Graduate School of Public Administration, Harvard University, n.d. (Mimeographed.)
- Johnston, J. Statistical Cost Analysis. New York: McGraw-Hill Book Co., Inc., 1960.
- \_\_\_\_\_. Econometric Methods. New York: McGraw-Hill Book Co., Inc., 1963.
- Leftwich, Richard H. The Price System and Resource Allocation. revised ed. New York: Holt, Rinehart and Winston, 1964.
- McNerney, Walter J., et al. Hospital and Medical Economics. 2 vols. Chicago: Hospital Research and Educational Trust, 1962.
- Mills, Frederick C. Statistical Methods. 3rd ed. New York: Henry Holt and Company, 1955.
- Milner, William E. Simple Correlation Coefficient. Program 1620 - 06.0.052. I.B.M. 1620 General Program Library. (Mimeographed.)
- Nemmers, Erwin Esser. Managerial Economics. New York: John Wiley and Sons, Inc., 1962.
- Richmond, Samuel B. Statistical Analysis. 2nd ed. New York: The Ronald Press Co., 1964.
- Rider, Paul R. An Introduction to Modern Statistical Methods. New York: John Wiley and Sons, Inc., 1939.
- Snedecor, George W. Statistical Methods. 5th ed. Ames, Iowa: Iowa State College Press, 1957.
- Spencer, Milton H. and Siegelman, Louis. Managerial Economics. revised ed. Homewood, Illinois: Richard D. Irwin, Inc., 1964.
- Stigler, George J. The Theory of Price. 3rd ed. New York: The MacMillan Co., 1966.
- Tintner, Gerhard. Econometrics. New York: John Wiley and Sons, Inc., 1952.
- Trussell, Ray. Prepayment for Medical and Dental Care in New York State. New York: Columbia University Press, 1962.

Watson, Donald S. Price Theory and Its Uses. Boston: Houghton Mifflin Co., 1963.

Young, Pauline V. Scientific Social Surveys and Research. 3rd ed. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1956.

### Articles and Periodicals

American Hospital Association. Hospitals, Journal of the American Hospital Association, Guide Issue. Chicago: 1949-1961.

Brown, Ray E. "Forces Affecting the Community's Hospital Bill," Hospitals, Journal of the American Hospital Association. Vol. 32. 2 parts (September 16, 1958), pp. 28f. and (October 1, 1958), pp. 51f.

Efroymson, M. A. "Multiple Regression Analysis." Article 17 in Mathematical Methods for Digital Computers. Edited by Anthony Ralston and Herbert S. Wilf. New York: John Wiley and Sons, Inc., 1960, pp. 191f.

Eltzman, Wilford J. "Factors Determining the Location of the Least Cost Points," The American Economic Review. Vol. 37 (December, 1947), pp. 910f.

Fineberg, M. H. "The Right Answer May Have the Wrong Meaning," Hospitals, Journal of the American Hospital Association. Vol. 32 (June 1, 1958), pp. 39f.

Fisher, Franklin M. "The Place of Least Squares in Econometrics: Comment," Econometrica. Vol. 30 (July, 1962), pp. 565f.

Ginzberg, Eli. "What Every Economist Should Know About Health and Medicine," The American Economic Review. Vol. 44 (March, 1954), pp. 104f.

"Health Care for the Aged: Here Are the Two Plans," U. S. News and World Report (Feb. 24, 1964), p. 46.

Hoch, Irving. "Estimation of Production Parameters Combining Time-Series and Cross-Section Data," Econometrica. Vol. 30 (January, 1962), pp. 34f.

Johnson, J. "Statistical Cost Functions: A Re-appraisal," The Review of Economics and Statistics. Vol. 40 (November, 1958), pp. 339ff.

Johnson, Paul R. "Some Aspects of Estimating Statistical Cost Functions," The Journal of Farm Economics. Vol. 46 (February, 1964), p. 179.

"Joint Committee for Accreditation of Hospitals," The Journal of the American Medical Association. Vol. 147, No. 8 (Oct. 20, 1951), p. 761.

Langford, Elizabeth A. "Medical Care in the Consumer Price Index, 1936-1956." Washington: Government Printing Office. Reprinted from the Monthly Labor Review (September, 1957).

Leontief, W. "Elasticity of Demand Computed from Cost Data," The American Economic Review. Vol. 30 (December, 1940), pp. 814f.

Letourneau, Charles U. and Ulveling, Melinda. "Hospital Costs - Some Influential Factors," Hospital Management. 2 Parts (Nov., 1959), pp. 36f and (Dec., 1960), pp. 40f.

"Metropolitan Area Pay Levels and Trends in 1965," Monthly Labor Review. Vol. 89, No. 1 (January, 1966), p. 27.

Noyes, C. Reinhold. "Certain Problems in the Empirical Study of Costs," The American Economic Review. Vol. 31 (Sept., 1941), pp. 473f.

"Problem of Medical Costs -- What Can Be Done About It," U. S. News and World Report (May 25, 1964), p. 72.

Robertson, Robert L. The Market for Hospital Care. Reprint Series No. 29. Madison: The Industrial Relations Research Center of the University of Wisconsin. Reprinted from Hospital Administration. Vol. 7, No. 1 (Winter, 1962), pp. 45f.

Roemer, Milton I. Hospital Utilization and the Supply of Physicians. Ithaca, New York: Graduate School of Business and Public Administration, Cornell University. Reprinted from The Journal of the American Medical Association, Vol. 178 (Dec. 9, 1961), p. 993.

Rorem, C. Rufus. "Associations and Professional Growth." An article in The Profession of Hospital Administration. Edited by Roger Klein, Glenn M. Hogan. Atlanta: Georgia Hospital Association, 1960.

"Round Table on Cost Functions and Their Relation to Imperfect Competition," The American Economic Review, Supplement. Vol. 30 (March, 1940), pp. 400f.

Shain, Max, and Roemer, Milton I. Hospitals and the Public Interest. Ithaca, New York: Graduate School of Business and Public Administration, Cornell University. Reprinted from Public Health Reports, Vol. 76, No. 5 (May, 1961), pp. 401f.



Staehle, Hans. "The Measurement of Statistical Cost Functions: An Appraisal of Some Recent Contributions," The American Economic Review. Vol. 32 (1942), pp. 321ff. quoted in George J. Stigler and Kenneth Boulding. Readings in Price Theory. Homewood, Illinois: Richard D. Irwin, Inc., 1952, pp.264f.

"Technical Notes -- 1960 Annual Survey of Hospitals," Hospitals, Journal of the American Hospital Association, Vol. 35, Part 2 (August 1, 1961), p. 386.

"Text Table I," Hospitals, Journal of the American Hospital Association, Vol. 36, Part 2 (August 1, 1962), p. 404.

Viner, Jacob. "Cost Curves and Supply Curves," Zeitschrift für Nationalökonomie, Vol. 3 (1931), pp. 23ff. quoted in George J. Stigler and Kenneth Boulding. Readings in Price Theory. Homewood, Illinois: Richard D. Irwin, Inc., 1952, pp.198f.

"Why It Costs More to Insure Against Illness," U S. News and World Report (January 31, 1958), p. 83.

Working, E. J. "What Do Statistical 'Demand Curves' Show?" The Quarterly Journal of Economics. Vol. 41 (1927), pp. 212f. quoted in George J. Stigler and Kenneth Boulding. Readings in Price Theory. Homewood, Illinois: Richard D. Irwin, Inc., 1952, pp. 97f.

#### Publications of U S Government

U. S. Congress, Joint Economic Committee. 1957 Historical and Descriptive Supplement to Economic Indicators. 85th Congress, 1st Session. Washington: U S. Government Printing Office, 1957.

U. S. Department of Commerce, Bureau of the Census. Current Population Reports, Population Estimates. Series P-25. Nos. 73, 93, 98, 101, 121, 146, 170, 193, 212, 246. Washington: U S Government Printing Office.

\_\_\_\_\_. Historical Statistics of the United States, Colonial Times to 1957. Washington: U S Government Printing Office, 1960.

\_\_\_\_\_. Statistical Abstract of the United States: 1946-1962. 67th-83rd editions. Washington: U S Government Printing Office.

U. S. Department of Commerce, Office of Business Economics. National Income. 1954 edition; Washington: U. S. Government Printing Office, 1954.

\_\_\_\_\_. Survey of Current Business, National Income Number.  
Vol. 42, No. 7. Washington: U. S. Government Printing Office,  
July, 1962.

U. S. Department of Labor, Bureau of Labor Statistics. Wholesale  
Prices and Price Indexes. Bulletin No. 1257. Washington: U. S.  
Government Printing Office, 1958.

\_\_\_\_\_. Wholesale Prices and Price Indexes. Bulletin No. 1295.  
Washington: U. S. Government Printing Office, 1959.

"The Revised Consumer Price Index," Monthly Labor Review. Washing-  
ton: February, 1953.

## BIOGRAPHICAL SKETCH

Harold Roger Phillips was born November 6, 1928, at Savannah, Georgia. In 1946, he graduated from Forest Lake Academy in Maitland, Florida. He received the Bachelor of Arts degree from Southern Missionary College in 1950. From 1951 until 1954, he was credit manager for Walker Memorial Hospital in Avon Park, Florida. He was assistant administrator of Hialeah Hospital, Hialeah, Florida, from 1954 until 1957.


In 1957, he enrolled in the Graduate School of the University of Florida. He worked as a research assistant in the College of Business Administration and for one school year was an University Fellow before September of 1960 when he became a teaching assistant. The Master of Business Administration degree was awarded him in January of 1961. He taught at Arizona State University from 1962 until 1965 and at Andrews University since 1965 while conducting research to complete the requirements for the degree of Doctor of Philosophy.

Married to the former Betty Lou Cummings, he is the father of two children. He is a member of the American Economic Association, the Academy of Management and Sigma Iota Epsilon.



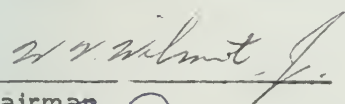
This dissertation was prepared under the direction of the chairman of the candidate's supervisory committee and has been approved by all members of that committee. It was submitted to the Dean of the College of Business Administration and to the Graduate Council, and was approved as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

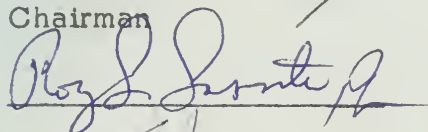
August, 1966

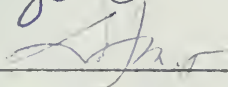
  
\_\_\_\_\_  
Dean, College of Business Administration

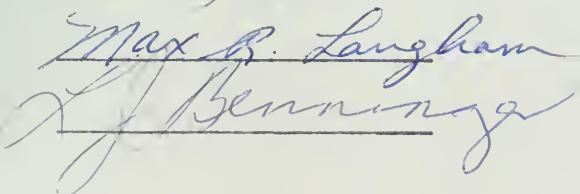
\_\_\_\_\_  
Dean, Graduate School

Supervisory Committee:

  
\_\_\_\_\_  
Chairman

  
\_\_\_\_\_  
Roy L. Jernette

  
\_\_\_\_\_  
Max B. Langham

  
\_\_\_\_\_  
J. Benning

125 40  
4660 11